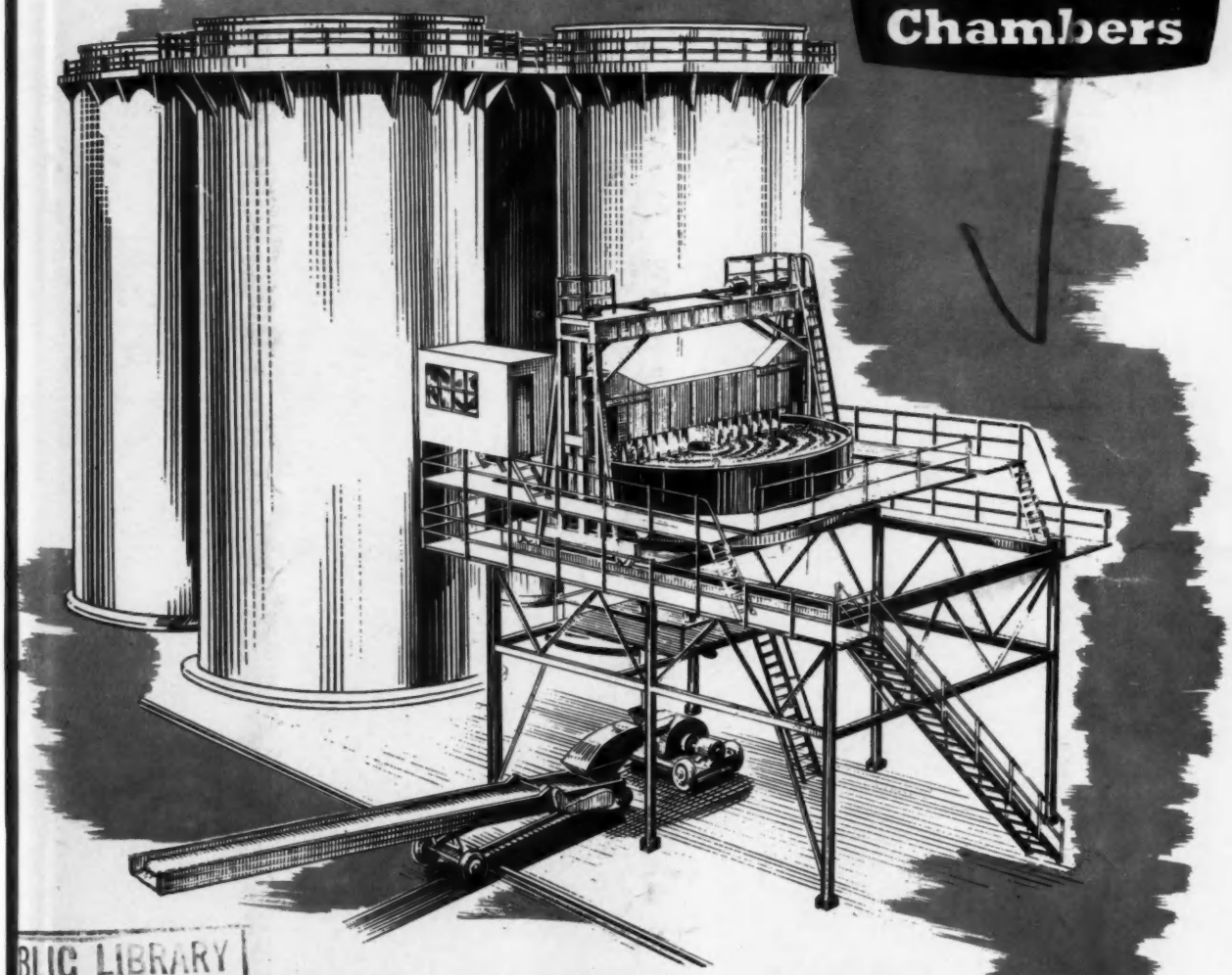
Gas Journal

VOL. 292. 109th YEAR. LONDON, OCTOBER 23, 1957. No 4919. PRICE 1/6

Mechanical Oxide Discharging of Tower Purifiers

a new development by **Newton Chambers**



Mechanical oxide discharging is a new development by Newton, Chambers towards the complete mechanisation of Tower Purifiers. This new patented discharger is in operation at the National Coal Board plant at Monkton which handles up to ten million cu. ft. of gas per day.

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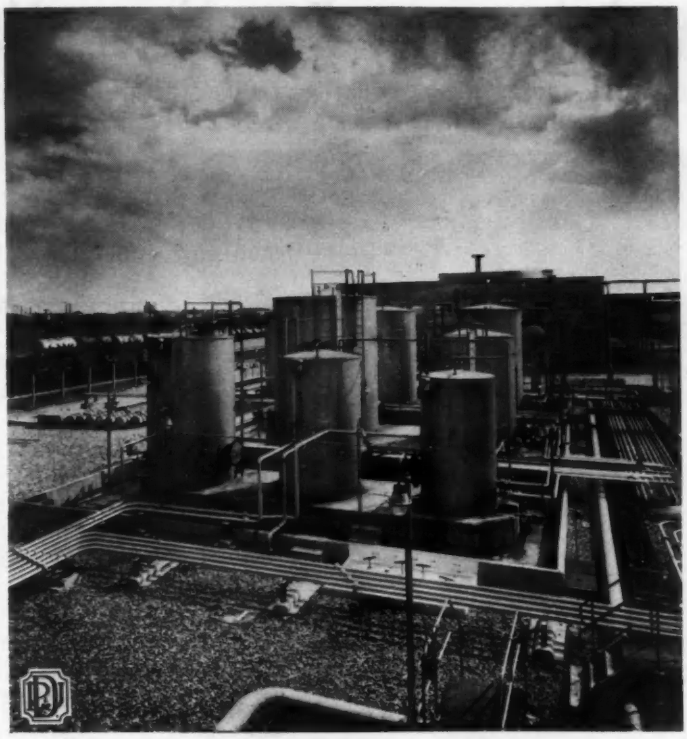

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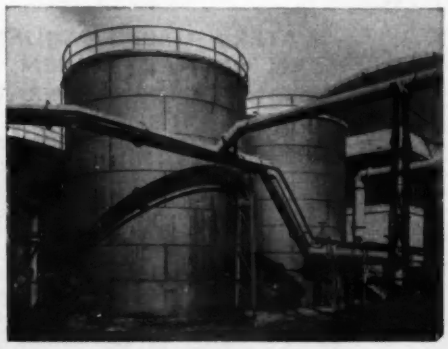

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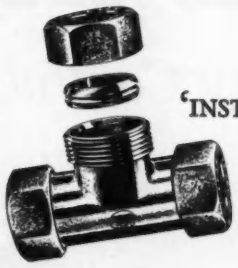

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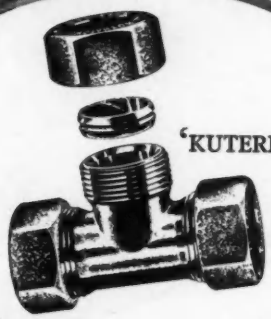
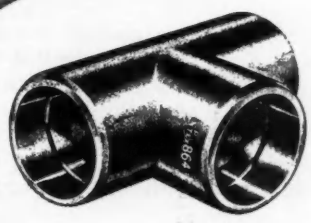


'KUTERLITE'

Fittings from Fyffes



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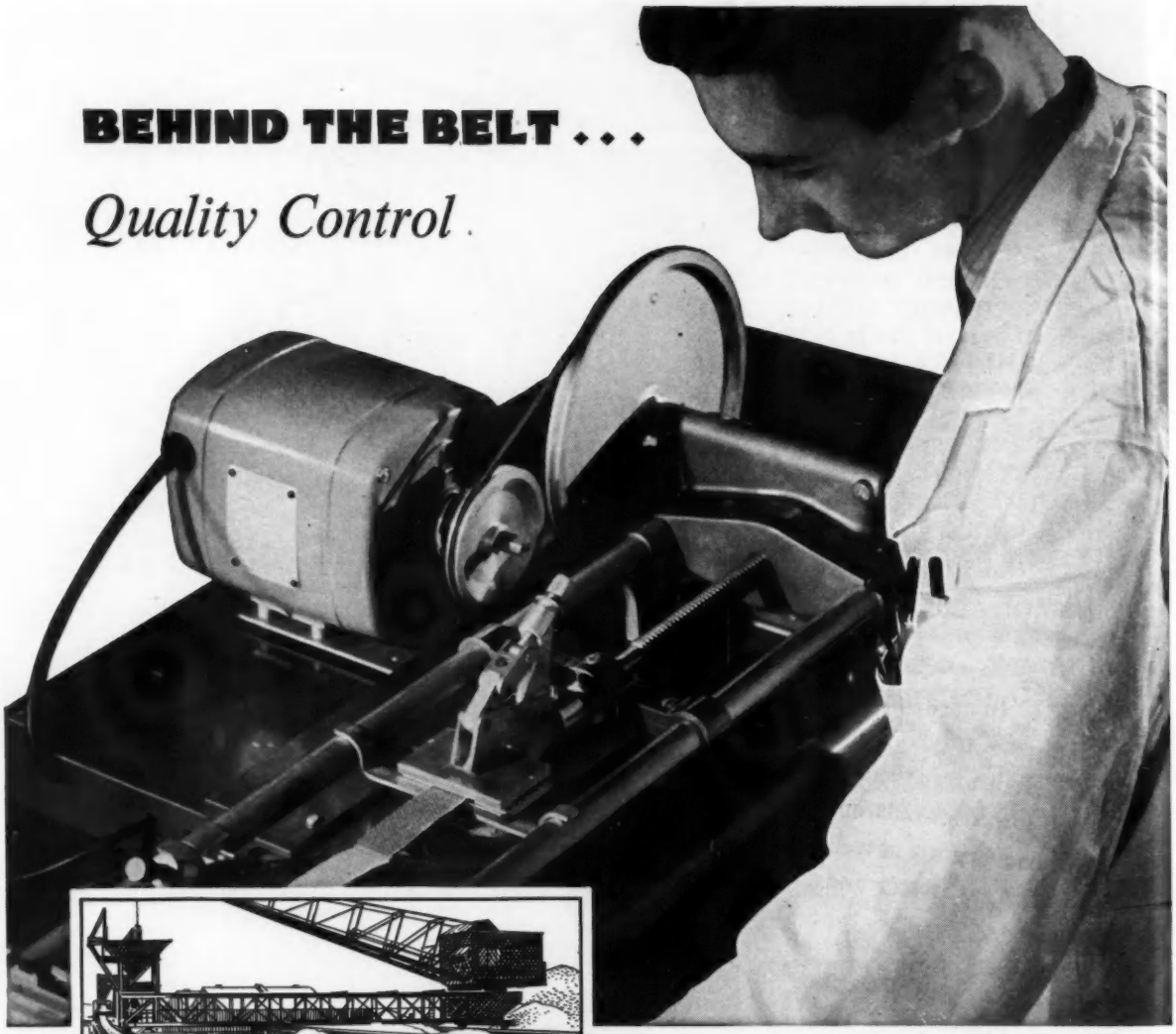

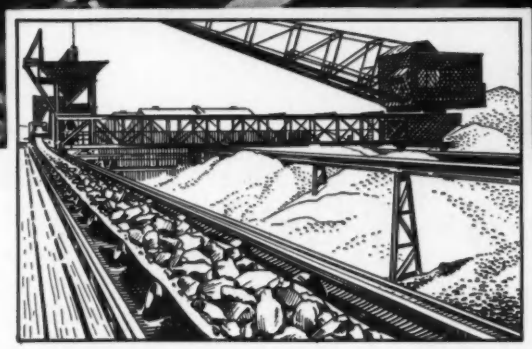

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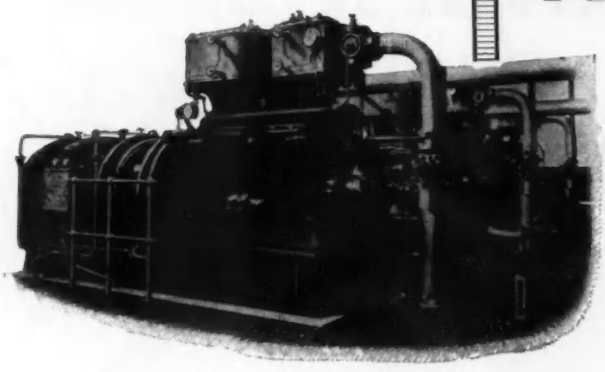

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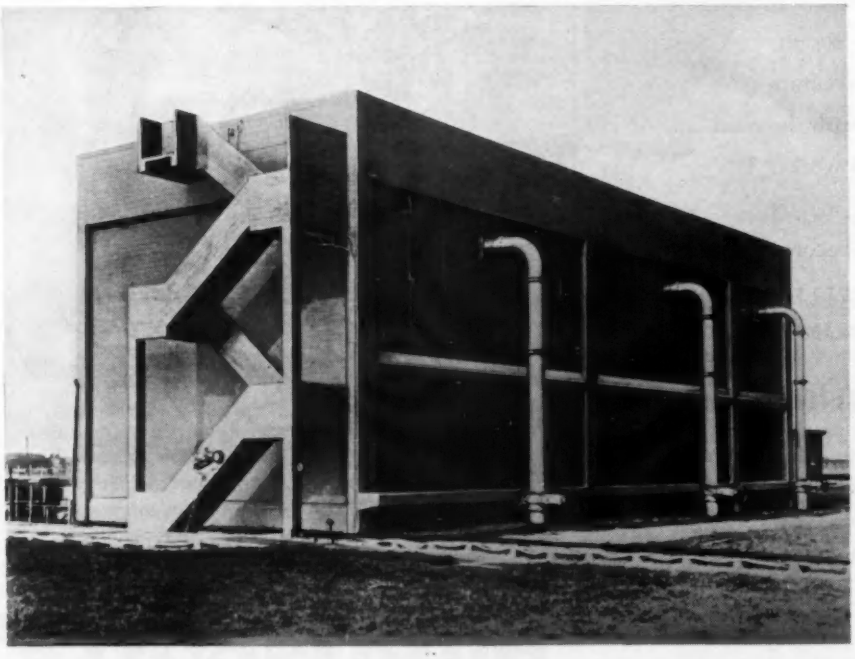

WATER COOLING BY MODERN METHODS

Four towers of the type illustrated have been constructed at the new gas producing plant at Morwell, Australia, described in the May 22 issue of Gas Journal.

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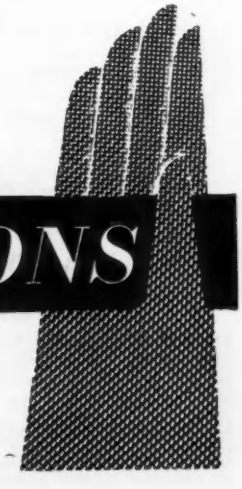

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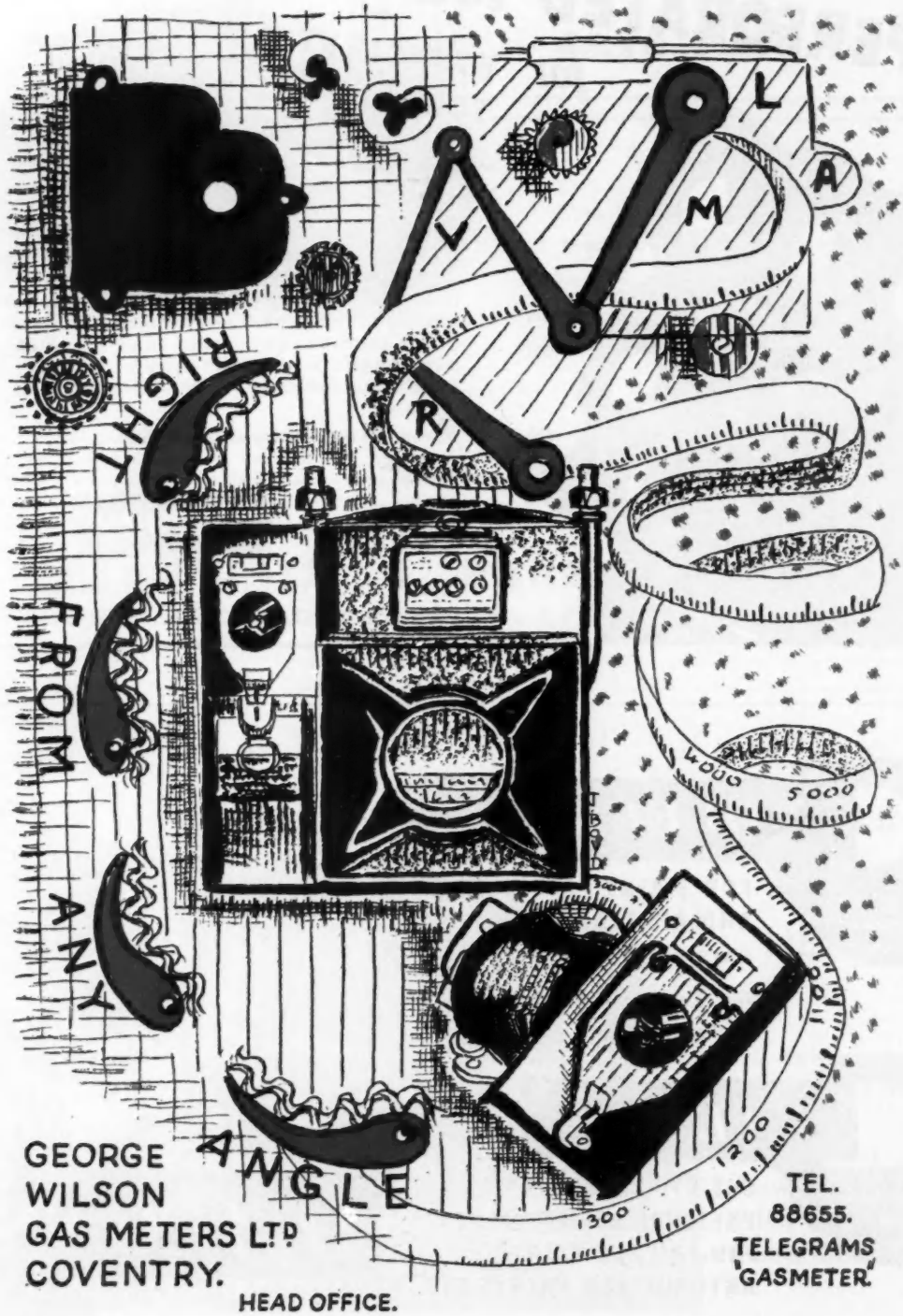
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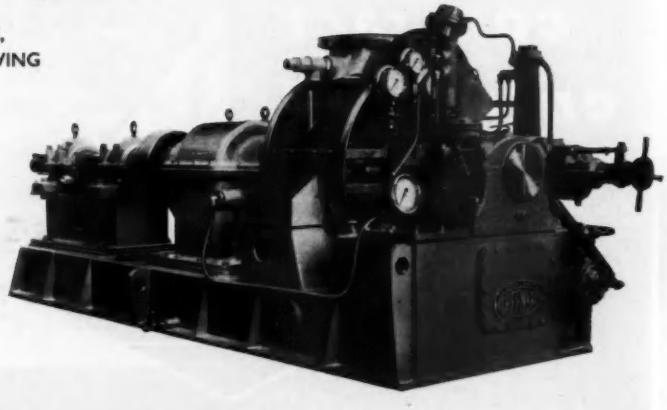

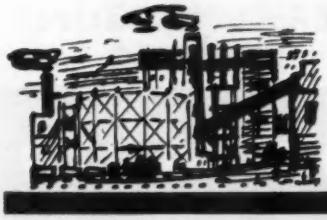

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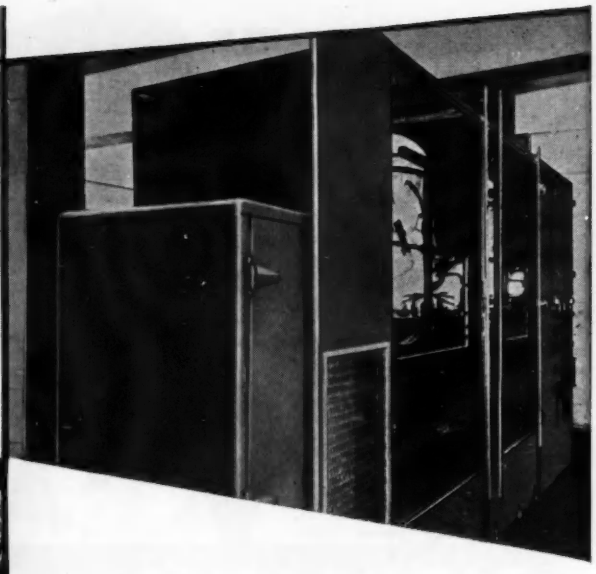

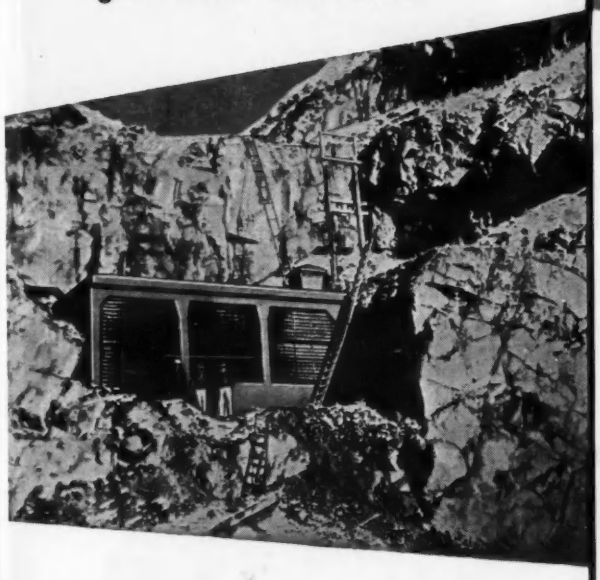

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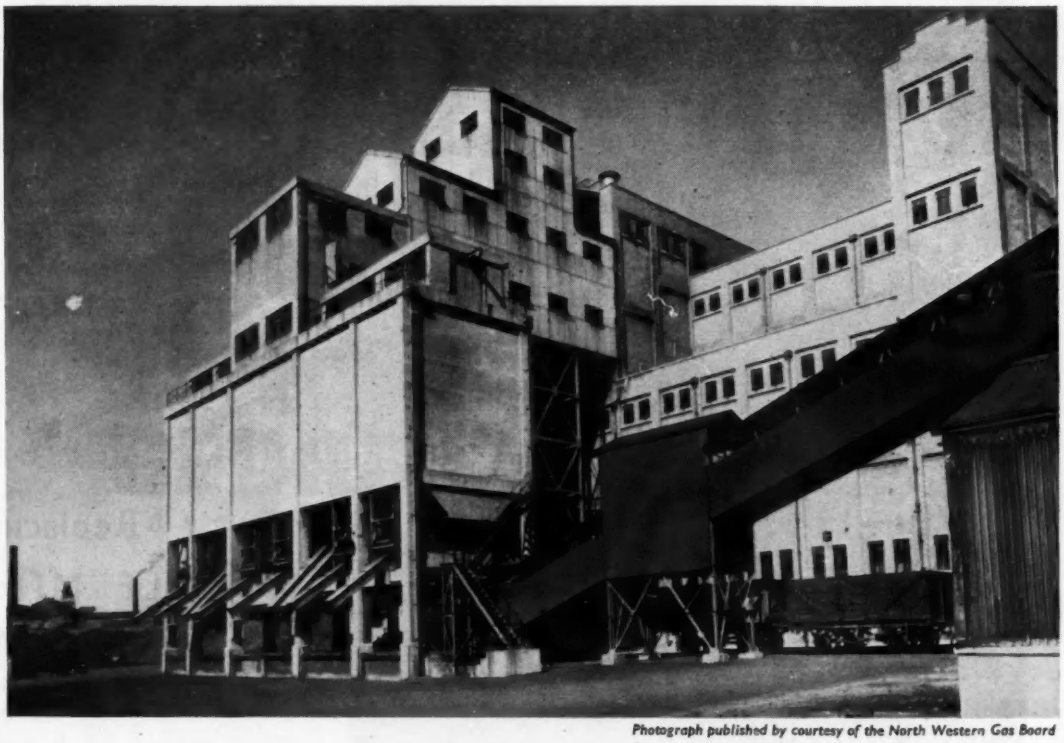

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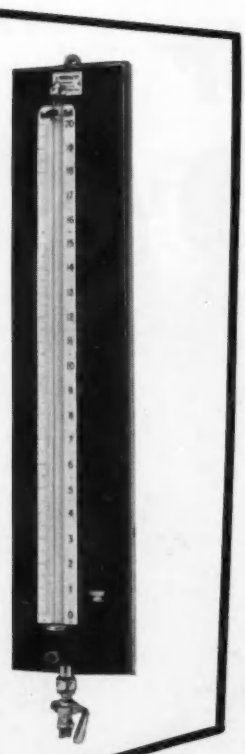

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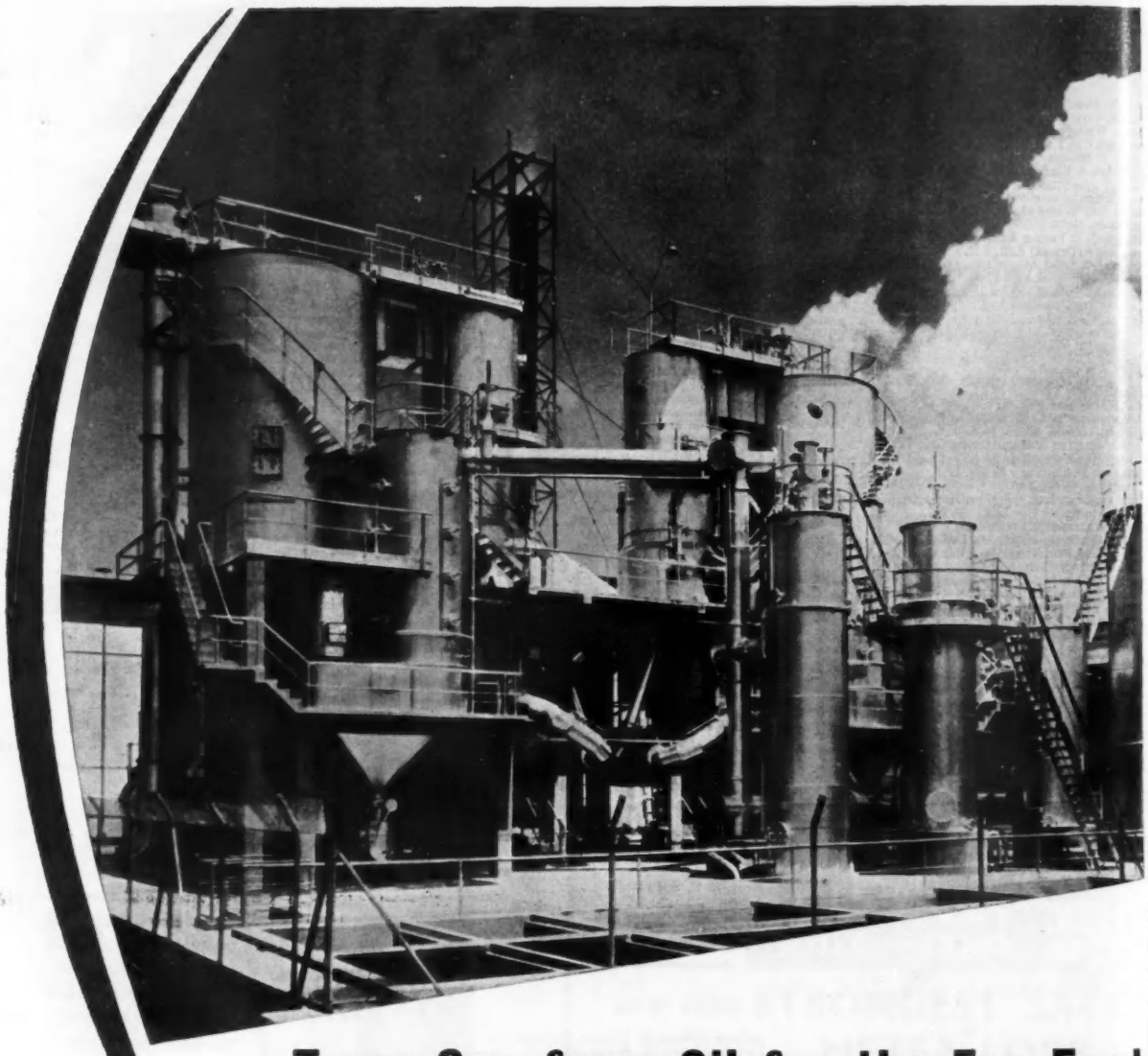

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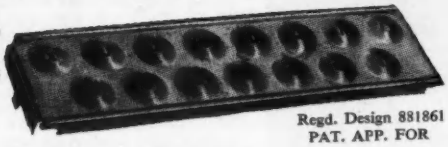

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PAT. APP. FOR

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Telephone: Perivale 3238. Telegrams: Gasfret, Greenford, Middlesex.

Agents in Australia:
Mackay Sim Pty. Ltd., 788, Pacific Highway, Gordon, Sydney, N.S.W.

Gas Journal

VOL. 292 NO. 4919 October 23, 1957

109TH YEAR

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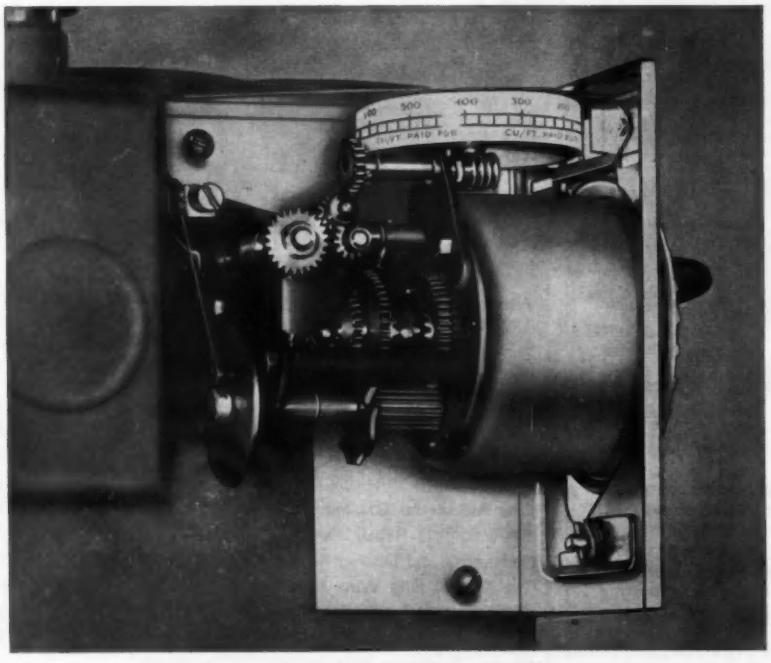
the new look *in P/P meters*

the T.G. D1 meter with the new 'G' movement



The most modern movement on the market, the T.G. 'G' mechanism is compact, gives positive valve opening upon insertion of the first coin, and, with its unique double differential gear, has a single slot for dual coin operation. The 'G' movement also offers finger-tip coin entry, each coin being readily drawn in by the precision mechanism. Built to give years of trouble-free service, and withstand present day conditions, the 'G' movement is nevertheless detachable and replaceable *in situ.*

Thomas Glover and Co. Ltd.

Gothic Works, Angel Rd., Edmonton N.18 and Branches

Leaders in Gas meter manufacture for over 110 years TG37

Gas Journal

VOLUME 292. No. 4919. OCTOBER 23, 1957. 109th YEAR

What do we know about the housewife?

WE make no apology for devoting our first editorial this week to the housewife because without her there would be no gas industry and therefore no 'GAS JOURNAL.' Yet considering that she is our *raison d'être*, the housewife seems to rate a surprisingly small amount of the industry's attention. How much do we really know about her? Do we fully understand her domestic requirements and her personal taste? Are we sure that we employ the right methods for attracting her attention and influencing her opinion? Our guess is that, generally speaking, we as an industry know far too little about our No. 1 customer. This long-held conviction received a sudden stimulus at the Gas Sales and Service Conference at Harrogate when Dr. Mark Abrams, Director of Market Research for the London Press Exchange, in a brilliant talk on 'The Housewife and Advertising,' quickly sketched in a clear picture of how our major market is composed. In the following notes we shall try to give the essence of Dr. Abrams' address and draw a few conclusions.

Pointing out that there is no single uniform pattern of characteristics that applies to all the 16½ mill. housewives in Great Britain today, Dr. Abrams began by indicating the main sub-groups into which they may be divided.

The first and perhaps most obvious classification of housewives is by age. Over the past 15 years the age at which people get married has fallen steadily. One consequence of this is that today a very proportion of all housewives are comparatively young. The most recently available statistics on this show that almost one-quarter of all housewives are under 35 years of age which, as Dr. Abrams pointed out, means that they were no more than schoolchildren in the 1930's and in their adult lives have known nothing of the great pre-war publicity drives for Mr. Therm and his many talents. On the contrary, these 4 mill. housewives are much more familiar with coal rationing, electricity cuts, inconvenient stretches of low gas pressure and constantly and steeply rising fuel prices. Each year over 400,000 young women get married, a figure which will increase over the next ten years as the infants born during the birth rate boom of the war years become adults.

A second important difference within the ranks of housewives is the division between those who go out to work and those who stay at home. Between 1948 and mid-1956 the number of women working in this country increased by almost a million. At least a quarter of all married women now go out to work, and this ratio is highest among married women in their late twenties and those in their forties. These 4 mill. are comparatively rich in money but poor in leisure; their main interest is to economise in time and labour and thus they become the steadiest patrons of self-service stores, of mail order houses and of household equipment which saves effort and is easily switched on and off as it is needed. But in acquiring and selecting this equipment they can afford very little time for looking around. They tend to buy the apparatus that is most accessible and which least interrupts their workday when it has to be installed.

A third context in which different groups of housewives differ sharply in their characteristics relates to the ownership of fuel-using equipment. Dr. Abrams explained that while 70% of housewives have a gas cooker and 36% a gas boiler, only negligible proportions have any first-hand experience of any other gas-using appliances. Thus, less than 18% have a gas fire and nearly three-quarters of these are of pre-war design and performance; and only 12% have a gas water heater—nearly half of them pre-war models. In sharp contrast there are the other and larger minorities who, especially in recent years, have turned to other fuels for room warming and water heating. Thus, nearly 60% of housewives have at least one electric fire and one-third of these have bought electric fires within the past five years; over 20% have an electric water heater and more than half of these have been acquired in the past five years. Apart from the 'gas-conscious' housewife and the 'electricity-conscious' housewife another recent and growing group consists of those who have become accustomed to using oil heaters for space warming. One home in four uses at least one oil heater.

Another important difference which sets some housewives off from others is in terms of their housing conditions. Since the end of the war approximately 2¾ mill. new dwellings have been built. In other words, one-sixth of all households are living in homes constructed by architects and builders who for the most part made a special effort to provide facilities which economised in the demand for solid fuel. On the other hand, roughly half the housewives in this country occupy

houses and flats built during the 19th century, when it was assumed that solid fuel would be the basic means of cooking, water heating, and space warming.

The final line of division drawn by Dr. Abrams was that of differences in income. Ignoring the 10% of very rich households and very poor ones, the population can be divided into two main groups—middle class and working class. In the former (which constitutes 30% of the total) the head of the household has a white-collared job and usually earns at least £800 a year. The working class makes up the remaining 70% of the population and here the head of the household is a manual worker and usually earns below £15 a week. Working class households account for nearly 55% of all consumer expenditure; but the average family in this group spends only 11s. 6d. a week on fuel and light all the year round. As Dr. Abrams pointed out, as this is less than one-third of what it spends on drink and tobacco, such a family seems to be an under-developed market with, so far, little appreciation of the additional satisfaction that might come from spending an extra shilling or two weekly on fuel. The average middle class family spends about 17s. 0d. a week on fuel and light throughout the year.

Turning to advertising, Dr. Abrams said that during 1956 approximately £330 mill. was spent on advertising of all kinds, of which £280 mill. was devoted to the selling of consumer goods and services. This means that consumer advertising is equivalent to 2.2% of all consumer spending. *If the same ratio had prevailed in the gas industry there would have been an advertising expenditure of almost £2¾ mill.—excluding any advertising expenditure by the manufacturers of apparatus.* Of the £280 mill. approximately half was spent on Press advertising, 12% on leaflets, catalogues, etc., 8% on window and interior display material, 7% on posters, 5% on exhibitions, 5% on television and the balance went on a variety of media. Over the past 12 months, said Dr. Abrams, total advertising expenditure has probably increased by at least a further 5%, but perhaps more important than this increase has been the shift in relative allocations. In 1956 advertisers spent £15 mill. on buying time on commercial television and producing commercials. This year the total will almost certainly top the £35 mill. mark and the average manufacturer concerned with consumer expenditure is allocating around 12½% of his advertising appropriation to commercial television. Already over a quarter of all households have sets able to receive I.T.A. programmes, and by this time next year the proportion may well be as high as one-third.

A national readership survey provides detailed readership figures for some 85 publications ranging from the national dailies to monthly magazines and enables an advertiser to select with considerable precision schedules which enable him to reach those he is interested in, e.g., housewives, at the minimum cost. But, continued Dr. Abrams, media selection should be based on the use of particular publications to reach specific groups of housewives. It is comparatively unusual to find a publication with a constant rate of coverage over all groups. Attaching consumers' choice to particular goods is achieved by convincing consumers that the advertiser has something that meets their needs and hopes in a more satisfactory way than anything else on the market. Dr. Abrams concluded by stressing that to carry conviction—and sell his goods—the advertiser must do four things: Understand fully and deeply what these consumer needs and hopes are; express with clarity his ability to meet them; convey this message, within the limits of his advertising allocation, to every potential customer; and produce a product which lives up to his claims. A failure at any one of these four stages in the advertising process means wasted advertising expenditure.

Those remarks constitute an invitation to take a good, hard look at our advertising at Gas Council, area board, and manufacturer levels and see to what extent gas and gas appliance advertisements are tailored to appeal to housewives of all kinds. But surely the implications of Dr. Abrams' address go beyond the limits of advertising. To what extent do we produce appliances, devise tariffs, and fashion a service to meet the needs of the types of housewives he describes? It all amounts to market research and we are reminded of something said by Mr. A. E. Tullberg, Publicity and Information Officer of the South Eastern Gas Board, also at Harrogate, but at another session. In the course of proposing a vote of thanks to Mr. C. H. Leach, he said: 'Isn't it about time the gas industry had its own central market research organisation? Break down the findings to board areas, of course, but let's stop some of the guessing and base our marketing on ascertainable facts and not hunches. We have our Watson House, full of experts on gas appliances. I would like to see a sort of Sherlock Holmes house, manned by experts on marketing and market analysis, who would be able to tell our dear Watsons what sort of gas service our customers are really looking for.'

We endorse those sentiments. One of the main reasons why our sales have not expanded in recent years as they should have done is that there has been too much guesswork, too much *old-fashioned* planning—if that is not in itself a paradox. We cannot afford to continue these outdated methods. Commercially speaking, life is too short.

Gas Industry Statistics

ACCORDING to the latest Gas Council statistics for the April to June quarter, gas production fell 3% below last year's level for a similar period. Coal gas manufacture was reduced 5% but water gas was 8% higher. Oil gas production has almost doubled over the year, increasing from just under 1 mill. therms to more than 1.8 mill. therms. The amount of coal carbonised showed a decrease of 6%, but the quantity of coke used in water gas making increased by 4%. Surplus gas purchased from coke ovens and oil refineries during the quarter was 8% greater than in the same quarter of 1956, with the result that total gas available was down by only 1%. Coke production fell by 6% below production in the previous year for the April to June quarter. Although sales were 1% greater than in the previous year, stocks continued to rise. Crude tar production fell by 6% and the output of crude benzole was almost 14% lower.

It was the warm weather in the early months of 1957 which was responsible for sales of gas in April to June, 1957, being lower than sales in the corresponding period of 1956 by almost 5%. Domestic consumption suffered the greatest setback with a decrease of 6½%. Commercial sales dropped by 6%, but sales to industrial consumers were only slightly lower than in the June quarter of 1956.

Seven Members of the Gas Industry are Honoured

Seven more members of the gas industry have received the British Empire Medal. Our picture shows, left to right, George Christmas Dix, works superintendent, Pembroke gasworks, Wales Gas Board; Sidney Hills, foreman service layer, Kent Suburban District, South Eastern Gas Board; Charles William Brown Deacon, works foreman, Boston undertaking, East Midlands Gas Board; Lord Mills, Minister of Power, who made the awards; William John Fishley, general consumer service inspector, Plymouth-Cornwall Division, South Western Gas Board; Ernest Windsor, meter shop foreman, Coventry District, West Midlands Gas Board; John Thomas Bailey, fitter, Barnsley undertakiing, East Midlands Gas Board; and Richard Dixon, appliance maintenance man, Blackburn Group, North Western Gas Board.

Personal Notes

MR. J. A. TOMES, District Manager, Stourbridge, will, commencing this year, be Chairman of the Joint Council of the British Junior Gas Association, and MR. H. J. REYNOLDS, Honorary Secretary, Midland Junior Gas Association, will also be Honorary Secretary of the British Junior Gas Association. Mr. Tomes has taken an active part in the work of the Midland Association for many years and was President in 1953-54. Mr. Reynolds has been Honorary Secretary of the Midland Association for 14 years and was President in 1954-55.

MR. R. G. PLUMMER is joining the Southern Gas Board on November 4 as Production Engineer. Mr. Plummer, who joins the Southern Gas Board from the North Thames Gas Board, entered the industry in 1930 as a pupil engineer successively at the Southall, Fulham, and Beckton gasworks. In 1946 he was appointed Deputy Station Engineer at Fulham and six years later Station Engineer at Bromley-by-Bow. His office will be at the Board's headquarters at Southampton.

MR. J. R. TYSOE has been appointed Divisional Manager in the Southern Division of the National Benzole Co. Ltd. with effect from August 1, 1957. Mr. Tysoe, who was formerly Assistant Manager of the Southern Division, joined the National Benzole Company in July, 1928. In 1940 he joined the Army and on his return to the Company in 1946 held appointments in the Midlands, until his promotion to Assistant Manager, Southern Division, in July, 1951.

MR. J. RUSSELL TAYLOR, at present Director of Development and Research for the Igranic Electric Co. Ltd., will relinquish his departmental responsibilities from January 1, 1958, to become Consultant to the Managing Director and management generally on all matters connected with development, research, and production. MR. G. B. HARROLD, who has been with the Company for 16 years and, as chief of the Standards Drawing Office for the past six years has worked closely with Mr. Russell Taylor, will become Chief Development Engineer, responsible for the execution of the Company's development and research policy and departmental organisation.

MR. DAVID L. EVANS has been appointed representative in South Wales by Donald Macpherson & Co., Ltd., to succeed MR. R. E. WHITE who has resigned his post with the Company to take a position in Rhodesia.

Obituary

MR. ROBERT FIFE, for many years Gas Manager in Kilmarnock, and a former President of the Scottish Association of Gas Managers, has died in Glasgow. In 1917 he became Works Chemist at Kilmarnock gasworks under William and Charles Fairweather, then Joint Managers of Kilmarnock Corporation Gas Department. He became Assistant Manager in 1921 and was appointed Manager in 1934. On nationalisation in 1949 he was appointed Group Manager of the Kilmarnock Group. Mr. Fife retired prematurely for health reasons in December, 1956,

Diary

October 24.—MIDLAND JUNIORS: Visit to the works of the Northern Aluminium Co., Ltd., Banbury.

October 24.—I.G.E. (WALES AND MONMOUTHSHIRE SECTION): Annual General Meeting at Porthcawl.

October 26. — WESTERN JUNIORS: Demonstration Theatre, Radiant House, Bristol, 2.30 p.m. Paper by Mr. R. G. Lloyd of Bristol, followed by discussion and tea.

October 29.—EASTERN JUNIORS: King's Lynn. 'The Use of Ammoniacal Liquor as a Nitrogenous Fertiliser,' by W. W. Law.

October 31.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2, 2.30 p.m. Address by Mr. Stirling Everard, M.B.E., Manager of the Board's Market Research Section—'Smokeless Zones and the Gas Load.'

November 5.—INSTITUTION OF CIVIL ENGINEERS: Presidential Address by Sir Arthur Whitaker. 5.30 p.m.

November 5.—SOUTH EASTERN G.C.C.: Caxton Hall, S.W.1. 11 a.m.

November 5.—EAST MIDLANDS G.C.C.: Meeting at Nottingham Chamber of Commerce, Smithy Row, Nottingham. 11.30 a.m.

S.E.G.B. SEIZES PUBLICITY OPPORTUNITIES

MOBILE SHOWROOM IS TAKEN TO TWO CONFERENCES

STRATEGIC use of the South Eastern Gas Board's mobile showroom gave them a clear field in publicising the value of gas and coke at two recent conferences—that of the National Smoke Abatement Society at Hastings and that of the Association of Public Health Inspectors at Eastbourne.

At Hastings, by arrangement with the local authority the showroom was parked right outside the Queen's Hotel, the conference headquarters.

Lord Mills, Minister of Power, who addressed the conference, visited the mobile showroom with the Chairman of the South Eastern Gas Board, Mr. W. K. Hutchison. Many of the 700 delegates from all parts of the country followed the Minister's example and studied the exhibits during the three days of the conference.

In the mobile showroom, in addition to displays of modern gas and coke space heaters and water heaters, there were exhibits showing how simply conversions of old-fashioned coal-burning grates and ranges could be carried out. Estimates of costs of conversions to gas or coke were boldly displayed.

A booklet entitled 'Replacement of Coal-Burning Domestic Appliances in Smoke Control Areas,' which has been specially produced by the Board, was distributed to delegates. It describes a variety of conversions, with costs, and also gives a table showing the comparative running costs of gas and solid fuel for domestic heating.

More than 2,500 of these booklets had been distributed to members of the Association of Public Health Inspectors at their 64th Annual Conference at Eastbourne two weeks previously. Delegates came from local authorities in all parts of the country.

Here the Board made arrangements to have the mobile showroom immediately outside the exit from the concert hall. It attracted immediate interest. During all the breaks in the conference, the showroom was crowded and delegates were most intrigued by the possibilities of conversions of old grates.

This conference, of course, was not only concerned with clean air. Clean food was on the agenda, too, and displays of gas water heaters received much attention. In addition, many delegates' wives were attracted into the showroom while waiting for their husbands.

The South Eastern Gas Board's mobile showroom was the only fuel exhibit at both Eastbourne and Hastings.

Seen on the steps of the South Eastern Gas Board's mobile showroom are, left to right, Mr. W. K. Hutchison, Chairman of the Board; Dr. R. Lessing, President of the National Smoke Abatement Society; Alderman Hussey, Mayor of Hastings; and Lord Mills, Minister of Power.

Pictured here are some of the displays of 'clean air' conversions in the showroom.

FIRST AID IN THE GAS INDUSTRY COMPETITIONS

Eastern Men and North Western Women Win at last week's National Final

The Eastern Gas Board team, winners of the men's Challenge Trophy, are seen after the presentation. With them are Sir Henry Jones, Deputy Chairman of the Gas Council, who presented the awards (fourth from right), Mr. J. H. Dyde, Deputy Chairman Eastern Gas Board (next to Sir Henry) and Mr. T. C. Battersby (third right), General Manager, Watford Division. Next to the Captain is Nurse Bateman, who coached the team. Members of the team are: D. Williams (Captain), R. F. Carter, D. J. Whitehead, E. C. Martin and J. W. Nicholson (reserve).

FOR the first time men's and women's first aid teams in the gas industry fought out together, at Friends House, London, N.W.1, which of them should represent the industry in the competition for the Grand Prior's Trophy at the Porchester Hall, London, W.2, on November 14.

The Eastern Board team won this distinction for the men, and the North Western team for the women. By their victory the Eastern team becomes the first to win the championship trophy for the third time. The North Western men have won it twice, but took fifth place this time. The North Western women scored their second victory. They won the first at Nantwich last year.

The full results for the men (out of a possible 400 marks (200 team test; 200 individual test) were:—

	Individual Test	Team Test	Total
Eastern	173	182	355
North Eastern	159	179	338
East Midlands	147	182	329
North Thames	172	155	327
North Western	160	164	324
Scottish	171	143	314
South Eastern	145	164	309
Southern	141	150	291
South Western	143	146	289
West Midlands	138	135	273
Wales	125	148	273
Northern	119	121	240

The full results of the women's competition were:—

	Individual Test	Team Test	Total
North Western	160	139	299
North Eastern	134	138	272
West Midlands	149	120½	269½
South Western	143	122½	265½
East Midlands	138	122	260
Scottish	130	126	256
Northern	109	116	225

Sir Henry Jones, Deputy Chairman of the Gas Council, presented the Challenge Trophies and individual plaques. He congratulated all concerned, and commended the spirit of help for others which the competitions engendered.

Winners for the second time running, the 'Liverpool' ladies with their Chairman, Mr. D. P. Welman and Mrs. Welman, Sir Henry Jones, and Mr. J. G. O. Drake, General Manager of the Liverpool Group, North Western Gas Board.

E.M.G.B. GRID REPAIR VEHICLE

Anyone looking at this picture might reasonably think the lorry was stuck . . .

. . . But he would be very wrong —as this picture clearly shows.

THE East Midlands Board's new backbone main passes through parts of Derbyshire where there is considerable mining subsidence and, in order to safeguard the continuous flow of gas, special measures are essential to ensure that speedy repairs can be carried out at any point along the main.

The backbone main is not laid alongside roads throughout its length; in many places it crosses fields and hills, so one of the first things to be settled was how to get all the plant and material required for repairing big mains to the site, especially when the ground is waterlogged.

Six-wheel Drive

This has been solved in the Notts. and Derby Division by the purchase of an ex-United States army truck chassis with a six-wheel drive.

A 'tailor-made' lorry was designed and built on this chassis by the Divisional staff at Derby. The lorry is equipped with a 2-ton hydraulic crane capable of lifting 18-ft. lengths of 24 in. diameter pipe, a pneumatic pump to move 11,000 gal. of water per hour, an air compressor with a complete set of trench digging tools, a 3 kW generator with powerful lighting equipment to enable the vehicle to operate 24 hours a day and two cradles, each holding an 18-ft. length of 24 in. diameter pipe or connections. All the necessary equipment and miscellaneous tools for sealing off and repairing a section of the main and laying a temporary bypass are also carried.

Normally the lorry carries a crew of two; any other men necessary make their way in a light van.

So far the lorry has only been on trial. Its ability to travel fully laden over rough ground and climb grass slopes with gradients approaching 1 in 4 has pleasantly surprised even the designers.

But one day it may be needed for the real thing. And it will be ready.

Correction

We are advised on behalf of the Ayling Industries Group that information supplied concerning the new Bribond factory at Burgess Hill, referred incorrectly to the original title of the company as Brighton Industries Ltd. This should have been Brighton Laminations Ltd.

Manchester and District Section Visit Joseph Crosfield & Sons

ABOUT 100 members of the Manchester and District Section of the Institution of Gas Engineers recently visited Joseph Crosfield & Sons' soap factory at Warrington, noted in the past for its pioneering work in the industrial development of the hydrogenation process for the conversion of oils into solid fats.

Extensive product research and development work continue, especially in the chemical and detergent field. Considerable progress has been made in the development of improved methods of manufacture and the introduction of specialised washing products for the textile and food industries.

The factory is an important customer of the gas industry, consuming some 60 mill. cu.ft. of gas a year.

Soap making technique, which has remained little changed over the years, is, basically, to heat oils mixed with a caustic soda solution. During the process glycerine is liberated from the fats, and removed by the addition of brine in which it is soluble. The brine and glycerine (the lye) are drawn off and the liquor is neutralised, evaporated, and refined, the remaining soap being run into moulds to cool and solidify.

In the chemical section silicate of soda is produced as well as a catalyst used by the oil industry in the cracking of heavy oil to produce high octane spirits. No other British firm now produces this catalyst.

Another section of the firm is engaged in the preparation of edible oils and fats.

Mr. R. L. Greaves, M.B.E., presided over a brief meeting as Chairman of the section. Dr. J. E. Taylor, Chairman of the Company, who was accompanied by Mr. R. D. Cameron, Commercial Manager, and Mr. E. Cook, Personnel Manager, welcomed the members. Mr. Tilley, Vice-Chairman of the Section, thanked the firm for their hospitality.

Gas Council Film Wins Award

'DEMONSTRATION Selling,' one of the two Gas Council productions shown at the recent Harrogate Festival of Films in the Service of Industry, was awarded second prize in the category covering sales and dealer training films.

Dr. Charles Hill, Chancellor of the Duchy of Lancaster, presented a certificate to Mr. Stanley Irving, Gas Council Films Officer.

Of 300 films entered for the festival, 131 were chosen for screening at Harrogate.

Underground Gasification Outlook Improves

'COST MAY FALL BELOW 1.7d. PER THERM'

THE cost of making gas from coal underground—using seams which are uneconomic to mine—is likely to be even less than forecast last year, and much less than conventional fuels.

This view was expressed recently by Mr. C. A. Masterman, who has been engaged for eight years on underground gasification, first with the Ministry of Fuel and Power and the National Coal Board, now as a full-time member of the team brought together by Humphreys and Glasgow, Ltd., as contractors to the National Coal Board appointed to develop this project.

Mr. Masterman, who was reading a paper on the subject to the North of England Institution of Mining and Mechanical Engineers at Newcastle-upon-Tyne, said that this gas used to generate electricity might cost about 4d. per therm in an installation constructed on the basis of present-day experimental technique. This compared with 4d. per therm, the average cost of coal to power stations, and 6d. per therm, the cost of imported coal.

By 1964 improvements in technique and streamlining of engineering work might bring the cost of gas made underground to 1·8d. per therm. 'In the long run a cost of lower than 1.7d. per therm may well be attainable,' Mr. Masterman said.

These estimates were based on a comparatively thin and shallow seam—3 ft. thick, 400 ft. deep. But even if the depth were increased to 1,000 ft., the cost of gas would be increased by only some 15%.

A pilot plant is now being provided at Newman Spinney, Chesterfield, to serve a 3,750 kW generator to be built by the Central Electricity Authority. The plant is planned to be in operation by the end of next year.

With the development of nuclear power to meet Britain's electricity base load, Mr. Masterman said the meeting of the peak demand by other means might become an increasing anxiety because of the high capital cost and low 'fuel' cost of nuclear power. A flexible low cost output from underground gasification might then be a specially useful complementary source of supply.

'Convincing evidence such as to justify the planning and preparation of the first commercial system should not now be long delayed,' he suggested, adding that there seemed good prospects that this stage would be reached by 1959.

Mr. C. A. Masterman was with the Gas Light and Coke Company before the war as Chief Technical Officer in charge of Watson House. After service with the Ministry of Supply and the Gas Directorate of the Ministry of Fuel and Power he became Convener to the National Gas Council post-war planning committee, and later Controller of Fuel Power and Public Utilities to the Allied Commission for Austria.

In 1949, he became Technical Director, Underground Gasification with the Ministry of Fuel and Power, later transferring to the National Coal Board. He is now a full-time member of the Humphreys and Glasgow team working on underground gasification for the Board.

New Address

The sales office and warehouse for the Birmingham area of Griffin & George Ltd., laboratory furnishers, is now in Frederick Street, Birmingham, 1, telephone number, CENtral 2552. The telephone number of their Edinburgh Office at Johnston Terrace is now CALedonian 4868.

RADIATION, LTD., STILL FACE DIFFICULT TRADE CONDITIONS

Letter Sent to all Company Stockholders

AT a recent meeting of Radiation, Ltd., it was decided to send the following letter to all stockholders in the Company:—

'In the Chairman's statement to the stockholders last March, reference was made to the difficult conditions in which the Company was operating; these conditions still persist. The slightly improved trends in sales of the Group's products have been maintained, but the trading results for the full year will greatly depend on the level of business achieved during the remainder of the year, which it is now harder to predict owing to the national financial adjustments recently announced.

'At a meeting of the Directors today it was decided to pay an interim dividend of 3% on the 6% Preference stock and to defer consideration of a payment on the Ordinary stock until the results for the year are available.

'The intensified programme of development is coming to fruition and . . . it is confidently anticipated that an attractive new range of modern domestic equipment, together with additional items in other fields of our activities, to be introduced during the coming months, will make a real contribution to the prosperity of the Company.'

GERMAN ENGINEERS VISIT BRITISH OIL GAS PLANTS

Some of the gas engineers from Germany who recently spent a week visiting Segas catalytic oil gas plants in Britain. Here they are seen at the York gasworks in company with officials of the Power-Gas Corporation Ltd.

Joint Demonstration

APPLIANCE EFFICIENCY CUTS COSTS

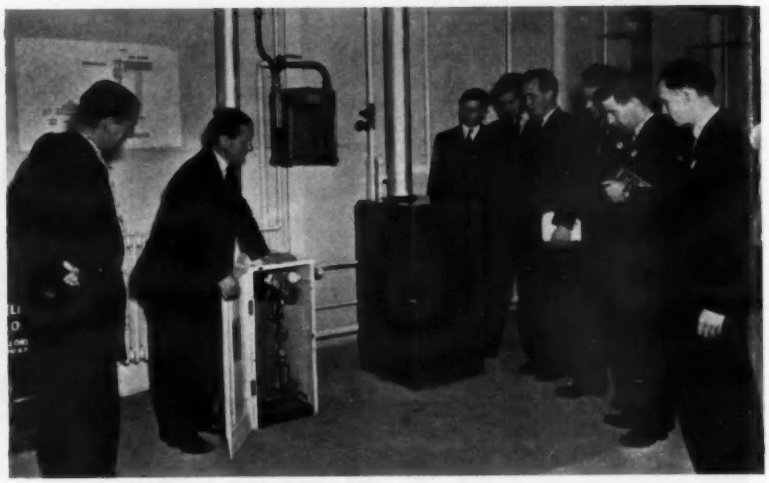
THE Scottish Gas Board and Thomas De La Rue & Co. Ltd., last week demonstrated in Glasgow a range of gas fired boilers that bring central heating, coupled with hot water supply, within the means of the middle class householder.

It was claimed at a Press conference which preceded the demonstration that gas has become comparable with other forms of fuel for such purposes. This was largely the result of increasing the efficiency of appliances.

The 'Diplomat' range of boilers of Thomas De La Rue and Co., Ltd., are suitable in appearance for a modern stream-lined kitchen and are easy to operate.

If the 'Diplomat' 30 is installed for central heating only, it will serve four or five radiators. With a direct hot water supply system, it will heat 30 gal. of water through 100°F. per hour.

'Potterton' Approved Installers



The 'Potterton' Division of Thomas De La Rue & Co., Ltd., have just opened a training school in Balham to provide instruction to the staffs of heating engineers on the erection, setting to run and after sales maintenance of gas and oil fired 'Potterton' boilers. Successful trainees will receive a diploma, and the companies employing them will become registered as 'Potterton' Approved Installers. Mr. Laurie Taylor (second from left) will be in charge of the training school.

VETO OF BOARD'S PLANS THREATENS MIDLANDS GAS

Permission to Erect Lurgi Plant Withheld

FUTURE supplies of gas for the Midlands will be jeopardised unless the West Midlands Gas Board can build a plant near Coleshill, Mr. J. Ramsay Willis, Q.C., said at a recent public enquiry.

Mr. Willis was appearing for the Gas Board in its appeal at Water Orton against the refusal of the Meriden Rural District Council of planning permission for a £4½ mill. Lurgi gas plant at Forge Mills, near Coleshill. Mr. Willis said that if the appeal was dismissed the local authority must show that damage to the amenities would be so serious that future supplies of gas must be put in jeopardy.

'The Board would be left having to start all over again with no reasonable hope of finding an alternative site,' he said.

'Industrial demands for gas are steadily increasing and it is necessary to plan ahead to meet the demands. With the plant which the Board has at the moment there would be an estimated deficiency by 1960-61 of 33 mill. cu.ft. of gas per week. The Lurgi plant would produce 35 mill. cu.ft. per day.'

Meriden Rural Council refused permission mainly because the site is in the green belt.

Strong enough words could not be found to convey adequately the urgency with which a new gas plant must be provided in the West Midlands Gas Board's central area if a serious deficiency in output was to be avoided, Mr. F. H. Bates, a Divisional Engineer, said.

Mr. G. le B. Diamond, Chairman of the Board, denied in cross examination that the necessary plant could be built on the Board's property at Washwood Heath, at present used for coal and coke stocks, even if alternative storage space could be found. The main difficulties would be the inadequacy of railway facilities.

The Warwickshire County Planning Officer, Mr. J. J. Brooks, said the building of a gasworks in the green belt between Birmingham and Coleshill would be 'pretty near a disaster.' He said that since 1948 application for the building of 47,000 houses in an area of nearly 50 sq. miles between Birmingham and Coventry had been refused. In under three years 116 appeals had been made to the Minister and 103 had been refused.

The Minister had paid out £250,000 as compensation for planning refusals made to save the land from housing.

On the second day of the inquiry, Mr. Herbert Jackson, supporting the objectors, said that if the West Midlands Gas Board was allowed to succeed where private persons had failed it would have a deplorable effect on public opinion.

The enquiry has been closed and the Minister's decision will be announced later.

S.E.G.C.C. Meeting

No Allowance on that Old Gas Fire?

AT the October meeting of the South Eastern Gas Consultative Council a letter was read from a consumer at West Byfleet asking why no allowance was made for discarded gas fires when a new model was purchased. It would appear that the Gas Board recommends customers to sell their old fires through newspaper advertisements.

The writer claimed that the Gas Board was 'out of step' in these matters, as almost everyone else made some allowance, however small, on traded-in articles; and, indeed, the Gas Board itself paid up to £2 for traded-in cookers.

The Chairman, Dame Alix Meynell, D.B.E., did not agree with this and said she had never heard of anyone getting an allowance on old furniture or an old bicycle. She thought it would be a good idea if the Gas Board could suggest names of firms in the district who might buy the old gas fires when approached by a customer on this point.

The question of trading-in allowances as a whole will be taken up at the next meeting of the Council, and it was suggested that the opinion of a sales and service officer might be helpful in reaching a decision on this matter.

SAFETY IN THE HOME CONFERENCE

'Don't Blame Accidents on Gas Appliances'

THEY ARE CAUSED BY CARELESSNESS AND MISHANDLING, SAYS DAME VERA

'EVERY gas appliance sold is perfectly safe in normal use. Accidents are caused by carelessness and mishandling,' said Dame Vera Laughton Mathews, D.B.E., in her welcoming speech to representatives of social welfare organisations at a Conference on Safety in the Home held recently at Watson House.

This subject is one of very general concern, bearing in mind that the yearly total of accidents in the home exceeds even the huge total of road accidents, and although fatal accidents associated with gas are far fewer than those due to other causes, the gas industry cannot be satisfied as long as there occurs a single preventable accident due to gas.

Mr. L. W. Andrew, Director of the Watson House Centre, spoke about the policy of the gas industry and said that one of the greatest aids to accident prevention was the smell of gas. He realised that many people look upon the smell of gas as an evil, but it is a very necessary evil in that it gives warning of the presence of raw gas. If gas did not smell, there might be a very much higher accident rate.

He went on to say that it was virtually impossible for an accident to occur through faulty installation of gas appliances, since the installation of all gas appliances is controlled by the gas industry and, further, all appliances must conform to British Standard 1250 and must be on the Approved List of the Gas Council. A special committee at Watson House gets a report of every accident that occurs in order that they may look into the technical aspect.

The groups particularly prone to accidents are the old, the very young and the physically handicapped. Mr. Andrew's comment that he classed a harassed mother trying to prepare a meal surrounded by young children as 'physically handicapped' brought sympathetic applause from the mainly female audience.

Mr. E. W. Dunning, Officer in charge of the cooker laboratory at Watson House, then gave a short demonstration of some of the gadgets manufactured in the cause of accident prevention. High on the list of causes of accidents is the turning on of gas taps and forgetting to light them. Automatic ignition was the answer to this, and further advances were being made in this field to cover the possibilities of the light being blown out by draughts or extinguished by water boiling over. A new device is one which automatically switches off the gas within a few seconds of the light going out.

The design of gas taps was another important aspect, particularly for the physically handicapped, and gas cookers are now on the market with 'lift up' taps and wide flange taps which he felt sure were making life easier for many people. Mr. Dunning said he knew that many parents complained that their small children could turn on the gas taps quite easily, but he was quite sure that if a tap was designed which a child of three could not turn on, grown-ups couldn't turn it on either!

Pan stability was another vital factor in accident prevention, and there are a number of gas cookers on the market now with specially designed tops which will keep pans steady, and which allow room for all the pan handles to be turned inwards to prevent children knocking them over.

Mrs. Joan Robins, Chief Home Service Adviser of the North Thames Gas Board, closed the conference with a talk on special facilities and services for old people. Many old people are using appliances which are out of date and need reconditioning, and she hoped that social workers would do all they could to see that these people were made aware of the dangers involved and to see that something was done.

British Coke on Show in Finland

Coke on show at the recent Helsinki Trade Fair in the pavilion promoted jointly by the Gas Council and the British Gas Coking Industry Association.

Summer Meeting

London Coke Sales Circle Visits Isle of Wight

THE London & Counties Coke Sales Circle's Summer Meeting was held this year at the Southern Gas Board's new Kingston works, Isle of Wight. A party of 90 Circle Members assembled at the Pavilion, Royal Pier, Southampton, where they were welcomed by Mr. A. F. Hetherington, Deputy Chairman of the Board.

After luncheon the party embarked in the ss. Varos, which had been specially chartered for the occasion, and steamed down the Solent in brilliant sunshine. They were given a commentary on the various landmarks they passed.

On arrival at the Southern Gas Board's private jetty at Kingston, the visitors were joined by the Isle of Wight coke merchants and their ladies, and were conducted over the new works. Circle members were particularly interested in the coke conveying and grading plants, which are of the most up-to-date type.

After tea, to which the visitors were entertained by the Board, the main party re-embarked, landing at the Royal Pier, Southampton, just as dusk fell.

Selective Air Heating for Domestic Use

THE HALCYON F.45 GIVES COMFORT AT REASONABLE COST

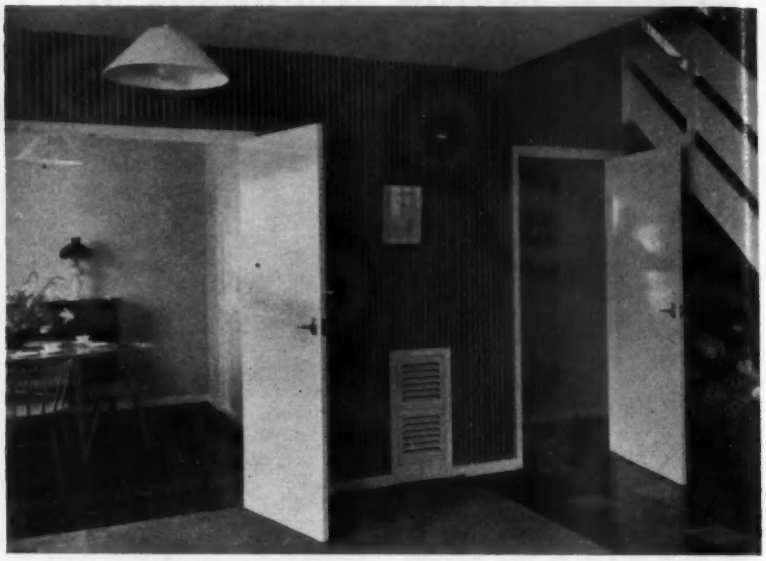
BOTH private developers and local authorities have for some years recognised that a higher standard of heating comfort is essential for the modern home.

Comprehensive heating of the complete dwelling has been provided by some local authorities in large blocks of flats and by private developers in houses built for the higher income groups. This policy of perfection has, however, except in a limited field, proved unsatisfactory owing to the high initial cost—£300-£400 per dwelling—and the running costs —about 1,000 therms a year.

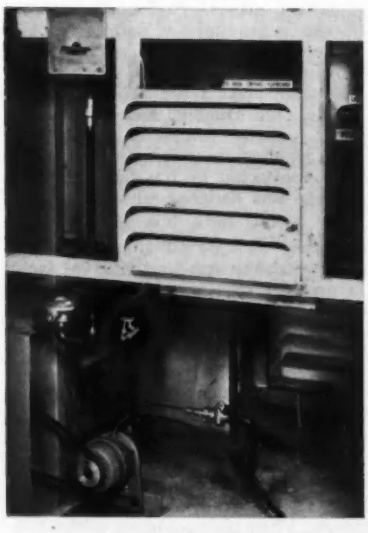
Whole-house air heating has also been tried and is giving complete satisfaction here, as in America, to those who can afford it, but the capital costs and running costs are still of the same order as those of conventional central heating and the field for this form of air heating is therefore also restricted.

Warmed air heating is, however, a particularly flexible method and with a view to reducing both the initial capital cost and the running costs experiments have been carried out over the last four years with Sugg 'Halcyon' air heaters, of a size insufficient to heat the complete dwelling at one time but more than adequate for heating the main living room.

'Halcyon' F.45 fanned air heaters were installed in central positions in several houses with short ducts to, and adjustable outlet louvres in, various parts of the house, so arranged that warmed air could be directed at will to the room or rooms in occupation without heating the whole house at one time.



Warm-air outlet grille with the return air grille below it is seen, centre, in the 'open-plan' lounge of the Wates 'Dormy' house. Note staircase to upstairs bedrooms and bathroom, double doors to dining room, and door to kitchen and ground floor bedrooms and bathroom.



Close up of 'Halcyon' heater compartment showing fan motor mounting, special combined gas cock and electric switch with indicator plate, warmed air outlet and damper controls, including the special control to the warmed air drying cupboard.

It was found that 'full comfort' conditions could be maintained in three to four bedroom type houses for gas consumptions of between 300 to 400 therms per annum. If the heating was limited to the living room only the running costs were found, on two-part tariff rates, to be comparable with solid fuel.

The South Eastern Gas Board early in the development stages interested Wates Ltd. in the possibilities of gas-operated air heating on the 'selective' principle, and, as a result of extensive pioneer work by the Board in co-operation with Wates Ltd. and William Sugg & Co., Ltd., the makers of the 'Halcyon,' have already installed, or will in the near future install, in Wates houses and flats nearly 200 'Halcyon' 'selective' air heaters on sites in Sutton, Croydon, Coulsdon, and Crawley and further Wates houses with 'selective' air heating are planned.

Local authorities and other private developers are also now interested in 'selective' air heating and already on the area of the South Eastern Gas Board alone upwards of 1,000 dwellings are planned for 'selective' air heating by gas-operated fanned air heaters. In many cases the houses and flats have been specially designed round the 'selective' air heating system.

The 'Se-Duct' provides a simple and inexpensive method of installing room sealed space heaters, water heaters, and clothes drying cabinets in multi-storey blocks of flats and a special model of the 'Halcyon' 'selective' air heater for 'Se-Duct' installation is available.

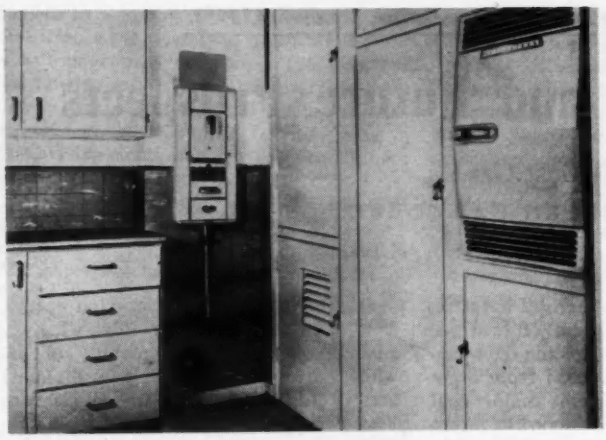
The public reaction to gas-operated air heating on the 'selective' air heating principle has been most favourable and the success of the Wates 'Dormy' type house utilising this form of heating has been so great that Wates Ltd. are prepared to grant licences to other builders to build 'Dormy' houses and already 'Dormy' houses with the gas 'selective' air heating system are planned for erection in several parts of the country.

A complete 'Halcyon' 'selective' air heating system can be installed for substantially less than £100 and the savings obtained by the elimination of the solid-fuel fire hearth, chimney, etc., will often largely cancel out this cost.

For three bedroom type houses a 'Halcyon' F.45 is usually adequate to meet the heating needs but in those cases where other additional heating in the coldest weeks of the year is desirable, or a 'focal' point in the living room is considered by the developer to be essential it is generally possible by suitable siting and the use of twin gas flue blocks to install for virtually the cost of the fire only a gas panel fire in addition to the 'Halcyon.'

The low capital cost of the 'selective' air heating installation and the building savings by the elimination of solid-fuel fires has already enabled the South Eastern Gas Board to install this system in houses selling for under £2,000 as well as in those selling between £3,000 and £4,000.

The market for this type of gas heating should therefore be almost unlimited and it appears to offer to the gas industry an excellent method of increasing its domestic gas load, especi-



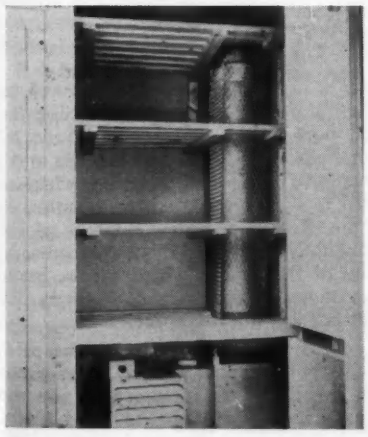
Kitchen of the maisonette showing gas incinerator with cupboard adjacent containing in the lower compartment the 'Halcyon' F.45 fanned air heater and controls, and in the upper compartment the special drying cupboard utilising warmed air from the 'Halcyon' heater below. The 'built-in' refrigerator is on the right.

ally where favourable two-part domestic tariffs are in operation.

Gas equipment in Wates 'Dormy' type houses at Sutton, Croydon, Coulsdon and Crawley includes the Sugg 'Halcyon' F.45 fanned air heater operating on the 'selective' air heating system, and Ascot '709' instantaneous multipoint gas water heater. Electrolux 'built-in' refrigerators are also fitted, these being gas or electric at purchaser's choice.

In addition, a Flavel 'Newbold' gas-ignited coke grate is installed as a 'focal' point and is a concession to tradition since except during very cold weather the 'Halcyon' air heater provides adequate heating. There are also points for gas cooker and gas washing machine.

The gas-fired 'Halcyon' 'selective' air heating system was decided on following extensive tests carried out by the South Eastern Gas Board in the prototype 'Dormy' house erected at Sutton and the great advantages of the system—flexibility, quick heating and low running costs have undoubtedly contributed to the immediate popularity of the 'Dormy' house with the buying public.



Cupboard in the hall of the Wates flat with doors open showing, below, warmed air louvre to the hall, and, above, the airing cupboard, heated from the exterior of the 'Halcyon' and the flue passing through it. Note protective wire guard.

This popularity is such that Wates Ltd. have arranged for the building of 'Dormy' houses under licence by other developers.

The Sugg 'Halcyon' F.45 fanned air heater is installed in a cupboard between the living room and the kitchen with short warm air ducting leading to louvres in the living room, the dining room and the passage leading to the ground floor bedroom and bathroom.

Adjustable dampers enable the warm air to be directed at will exclusively to either living room, dining room, or lower bedroom passage, or alternatively to any two of these outlets, or to all three at once. Experience shows that with the doors ajar the two bedrooms on either floor can be quickly heated to adequate comfort conditions or alternatively a good measure of background heating can be attained simultaneously in all rooms in the house.

Although, to avoid possible dissemination of cooking smells, no direct warm air outlet has been provided in the kitchen, the warmth from the exterior of the heater and the flue is used to give good clothes airing facilities in a cupboard built above the heater and also to provide background warmth in the kitchen.

Manual control is standard, but fully automatic control with one or more room thermostats and a four tappets time clock can be fitted at a small extra cost.

Some indication of the effectiveness and speed of heating of the system can be judged from the fact that with the 'Halcyon' air heater only in operation temperature rises of 28°F. were obtainable in the lounge and dining room within ten minutes of the warm air louvre being opened. With warm air directed to the lower bedrooms only temperature rises of about 20°F. were obtained within one hour. With all three warmed air outlets open simultaneously and the doors of all rooms upstairs and downstairs left ajar an average temperature rise all over the house of some 14°F. above a 42°F. outside temperature was obtained, the actual room temperatures varying from 52°F. to 57°F.

Hot water to the kitchen and the two bathrooms is provided from an Ascot 709 instantaneous gas water heater connected at Crawley directly to the rising water main and fitted with a water governor. Owing to the layout of the 'Dormy' house the most convenient place for fixing the Ascot was in a storage section of the roof space reached from a door in one of the upstairs bedrooms.

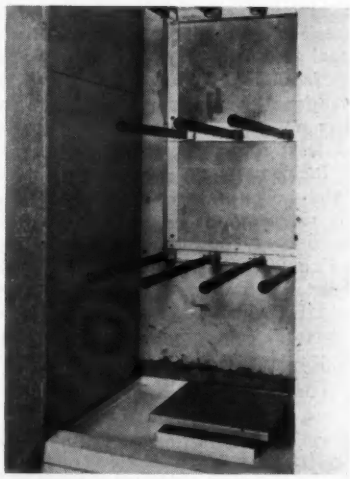
To ensure that even under adverse wind conditions, no products of combustion could be blown back into this bedroom a special air inlet duct from under the eaves has been constructed between two joints to a position immediately below the Ascot thereby virtually converting the storage section of the roof space into a 'balanced' chamber.

In the Wates flats the Sugg 'Halcyon' F.45 fanned air heater is installed in a cupboard in the hall with short warmed air ducting leading to louvres in the living-room, the kitchen-dining-room and the hall from which the two bedrooms are entered. Adjustable dampers enable the warmed air to be directed at will exclusively to each outlet or alternatively to one or more outlets simultaneously.

Manual control is standard, but fully automatic control with one or more room thermostats and a four tappets time clock can be fitted at a small extra cost. A linen cupboard is constructed immediately above the 'Halcyon' heater through which the flue passes—a heated airing cupboard is therefore available whenever the 'Halcyon' is in use.

In the maisonettes the Sugg 'Halcyon' F.45 fanned air heater is installed in a cupboard in the kitchen with short warmed air ducting leading to louvres in the living room and the kitchen-dining room. A third controlled outlet is also provided to heat the specially designed warmed air clothes drying cupboard constructed above and adjacent to the 'Halcyon' heater.

Manual control is also standard for the maisonettes.



Special warmed air drying cupboard in kitchen of Wates maisonette. The inlet from the 'Halcyon' heater is seen in the centre of the water-tight tray at the bottom of the cupboard.

Presidential Address to the Midland Junior Gas Association, October 8, 1957.

Current Trends and Future Prospects

By D. J. O. BATH, M.Inst.Gas.E.,
ASSISTANT ENGINEER, SOUTHERN GAS BOARD.

IN the light of the position in the coal and oil industry, it is not surprising that the consumption of coal for gas-making has reached a fairly static level while the quantities of gas produced from oil or purchased from other sources show an increasing trend. Several major coal carbonising installations have been commissioned in recent months but they have been accompanied by indications that 'they represent the last conventional coal-gas plant in their respective areas.' It is quite obvious that the emphasis on coal carbonisation has changed although such coal as can be obtained will undoubtedly continue to be carbonised or processed and it will be in the national interest to extract the maximum value from these supplies. Within the industry it does appear that we have reached a cross-roads in technical development. It is clear that normal high-temperature coal carbonisation has reached maximum efficiencies which now depend almost entirely upon the continued supply of the correct quality of coal. If this supply is physically restricted, or because of the Coal Board price structure becomes too costly, then alternative gas-making methods must be adopted and extended as rapidly as possible. The present construction programmes of the area boards suggests that this position has already been reached.

Economically Attractive

Of the alternative gas-making methods there are several processes which are at present economically attractive and which make use of the oil products from the rapidly expanding oil refineries in this country. The catalytic gasification of oil is now proceeding in a number of plants and many of the early operational difficulties, such as the heavy deposition of carbon and the emulsification of the oil tar, have been substantially overcome. It is now practicable to produce gas of varying calorific values, virtually free from naphthalene and at an economic cost relative to coal gas. The tar produced in the process proves a much more difficult by-product than that obtained from conventional gas-making plant, but considerable experience has now been gained, and it is possible to use this tar at least for the heating cycle on the plant.

Incidentally the use of coal tar or water gas tar for catalytic gasification presents an attractive alternative and, by virtue of the lower price of such feedstocks, gas production at considerably lower efficiencies than with fuel oil could be relatively economic. The use of coal tar has been practised on the catalytic oil gas plant at Stafford and I am permitted to quote the following figures which represent the average normal working results for a month's operating period:

Tar used ...	...	Heat raising	0.40%
		Cyclic heating	18.56%
		Conversion to gas	81.04%
Gaseous therms per gal. of tar = 0.64			
Gas made:	Calorific value = 470		
	Organic sulphur = 20.2 grs. per 100 cu.ft.		
	H_2S = 265 grs. per 100 cu.ft.		

I understand that the economics of the situation have now changed, however, and the use of coal tar has been discontinued at Stafford.

Our fellow gas engineers on the Continent have evolved new techniques of gas production during recent years and it is interesting to note how widely they have taken advantage of the large quantity of petroleum products which have become available on the market. Those members of this Association who were fortunate enough to visit Paris in 1954 will recall seeing the installations at Gennevilliers works including the Hall gas plant in operation.

Vigorous research work has continued in that country and there are now numerous gasworks employing new gas-making methods. These methods involve, mainly, processes for cyclic thermal or catalytic cracking of a series of hydrocarbons ranging from heavy fuel oil to natural gas and auto-thermal processes capable of achieving continuous catalytic or thermal reforming of various gaseous hydrocarbons.

The trend towards similar developments in this country was stressed in Mr. L. P. Ingram's paper to the Institution of Gas Engineers in May, 1957. The South Western Gas Board area, being situated most remotely from normal good quality carbonising coals, is at the same time well placed geographically for the receipt of oil by sea. The paper suggests that the Board is to place great reliance on continuing supplies of oil and there are to be installed at Gloucester two different types of oil-gas plant—Jones and Hall processes, the former being a producer of carbon for the rubber industry with gas as a by-product so that the plant will work on base load. Following upon the experiences gained from an experimental unit of Koppers-Hasche plant at Gloucester works, consideration is also being given to installing such an autothermic process for the distribution of reformed liquid petroleum distillate throughout a complete, self-contained district of the area. Although this would necessitate modification of all consumers' appliances it would offer advantages in reduced specific gravity and low inert content when compared with a butane-air installation.

Tail Gases

Other developments of note which relate the gas and oil industries in this country are the steps taken to utilise the tail fuel gases which burn at the flare stacks of the oil refineries. Of the total gases produced the refineries make use of a considerable proportion but the oil production processes are operated in such a way that the emission of some of the gas has the effect of providing a safety release outlet for the plant units concerned. There is, therefore, a limit to the amount of these gases which can be made available to the gas industry and the flares may be diminished as a result but will not disappear.

Some of the gas boards have negotiated with the principal oil refineries and publicity has already been given to the South Eastern Board Isle of Grain project and the supply of refinery gas from Shellhaven to the North Thames Gas Board.

The Southern Gas Board have completed similar arrangements with the Esso Fawley refinery and a ten-year agreement has been made for the supply of 17 mill. therms per annum of refinery gas which will be received into the Southampton works for catalytic reforming and inci-

dentally be equivalent to a saving of 115,000 tons of coal per annum. Installation of the catalytic gasification plant for this process will be completed during 1958 but the supply main from Fawley refinery to Southampton works was completed early in July, 1957, and for an interim period the refinery gas is being supplied for reforming in the fuel beds of C.W.G. plants and for cold enrichment of the reformed gas to town gas standards.

The C.W.G. plants used for this work are standard reverse-flow checkerless carburettor sets with a capacity of 2.5 mill. cu.ft. per day at 500 B.Th.U. per cu.ft. Certain modifications were necessary to these for the receipt of refinery gas and consisted of providing connections to the blast main for feeding the gas under the grates; connections to the carburettor bases for feeding gas during the back run; control and regulating valves on the refinery gas main to the sets and additional steam connections to the refinery gas manifolds, for purging. The hydraulic operators were also modified to incorporate the additional controls.

The refinery fuel gas supplied has an average calorific value of 1,300 B.Th.U. per cu.ft., a specific gravity of 0.93 and an H_2S content of 400 gr. per 100 cu.ft.

Increase of 40%

After a series of preliminary tests steady working conditions of the plants were established and refinery gas for reforming was being supplied at a rate of 1,800 cu.ft. per cycle or 864,000 cu.ft. per day on one set. The operating cycle was one of three minutes' duration with 26% blow and 74% run during which period refinery gas was admitted with steam for reforming in the proportion 26% back run and 26% up run. The resultant gas had a calorific value of 380 B.Th.U. per cu.ft. and additional refinery gas was admitted for cold enrichment of the reformed gas to adjust the calorific value to 475 after purification. The production rate achieved was 3.5 mill. cu.ft. per day from the set—an increase of 40% above nominal capacity.

In the process of reforming, carbon is deposited in the fuel bed and is burnt during the blow period so that the actual consumption of coke is considerably reduced and a figure of approximately 16 lb. per 1,000 cu.ft. of gas at 475 C.V. is obtained. The steam consumption is also low at 27 lb. per 1,000 cu.ft. of final gas as the generator works with a shallow fire zone and the temperature of the gas leaving the plant is only 500°F. This is cooled in a Lymn washer and needs no condenser. The plant proves self-supporting for process steam requirements and its overall thermal efficiency is in the order of 85%.

It is of interest to note that the final gas has an organic sulphur content of only 7 gr. per 100 cu.ft., an H_2S content of 170 gr. per 100 cu.ft. and the naphthalene is 0.8 gr. per 100 cu.ft. The specific gravity of the reformed gas is 0.6 and that of the final gas after cold enrichment to 475 C.V. is 0.65. This last factor has a controlling influence upon the total volume of refinery gas which can be admitted into the town gas supply because of the effect upon the Wobbe Index and the performance of consumers' appliances.

The oil industry has suffered some embarrassment at the increased consumption of fuel oils compared with motor spirit and, as a result, supplies of light distillates have become available throughout the world. The gasification of these distillates and the economics of the process are subjects worthy of close attention as published information indicates that a normal C.W.G. plant, when supplied with a petroleum flash distillate for reforming in the fuel bed and for carburetting, will increase its productive capacity by approximately 50% while reducing the coke consumption by about one half. If these primary flash distillates can be purchased at a price per therm comparable with heavy oil they will provide a cheaper fuel therm than coke at its present market price. For the use of P.F.D., however, considerable difficulties exist in the provision of safe storage on existing works. Modifications are needed to the plants before using this feedstock and to the standard pumping equipment, and a rigid attitude towards the safety aspect must be maintained at all times.

More advanced research in the production of synthesis gas has resulted in the development of the Texaco process which does not produce town gas directly but can be used in conjunction with other processes. The Texaco process operates at a pressure of 100-500 lb. per sq. in. The feedstock which may range from methane to heavy fuel oil, coal tar or pulverised coal mixes with steam and passes through a heater, raising the temperature to 700-800°F. This mixture then meets a supply of mildly preheated oxygen in an atomiser situated at the top of a generator. The resultant gaseous product is quenched with water, thereby raising the necessary steam for subsequent catalytic conversion, and is then purified from CO_2 and H_2S.

The oil hydrogenation processes, developed at the Gas Council Research Station and described in the paper presented to the Institution of Gas Engineers in November, 1956, also appear in the foreground of the field of research. In the ensuing discussion on this paper it was stated that a number of processes or combinations of processes were examined and it was concluded that a combination of the hydrogenation and the Texaco processes represented the greatest potential attraction. The successful commercial operation of such a gas production unit based on oil or coal would bring a new vitality to the gas industry.

The Government's prediction that there will be a rapid increase in the demand for good carbonising coals for the steel industry is a fair indication that the availability of such coals to the gas industry will diminish. The alternatives before us then will be to adopt coal blending, using lower rank coals to replace the shortage, or to practise gasification of the lower grade coals by one of the new processes now being developed.

Wider Range of Coals

The continued use of existing carbonising plants of modern design is to be expected and it has been shown that their operation can be adjusted to accept a much wider range of coals and to attain considerably increased throughputs by adopting the carrier gas technique to assist the heat transfer although this results in limiting the calorific value to 450 or perhaps 475. Such methods may lead to a cheaper gas therm by virtue of the reduction in cost of any lower grade coals carbonised or of the plant capital charges in relation to greater outputs.

It must be remembered, however, that the gas industry is a two-fuel producer and the cost of gas is very closely affected by the revenue from coke sales. Any alternative process for producing gas, with less coke, from coal must offer economic attractions of considerable proportion to justify its development.

The South Western Gas Board are moving in this direction, however, as well as with their oil gas developments, and are installing a Gaz Integrale plant at Gloucester which they estimate will contribute to a substantial reduction in the price of gas made.

Results obtained from the Lurgi plant which has been installed for pressure gasification of brown coal at Morwell, Australia, will also be studied with close interest and considered with similar information from the Continent for application to the low rank indigenous coals.

The search for natural gas in this country continues by the Gas Council but although small sources have been discovered and some is being used in Scotland it would be

too ambitious at this stage to anticipate any major supplies. Publicity has, however, been given to the probable early materialisation of the scheme to transhipliquefied methane from the overseas natural gas supplies to this country. Such a scheme involves the purification, liquefaction, refrigerated storage including during the ocean crossing, and transformation of the methane for supply to suitable plants in which it may be reformed into town gas. To be competitive with existing feedstocks it would need to be supplied to the gas industry at a price per therm below that of heavy oil and it would be processed in gasification plants to which lower capital charges apply than to conventional gas-making plants.

In this age of advanced scientific developments the source of energy to be derived from the fission of radioactive elements cannot be overlooked. Sir Charles Ellis, Scientific Adviser to the Gas Council, has reviewed the application of atomic energy to the gas industry and he estimates that research is proceeding to make available heat inputs to process equipments at 800°C. compared with the present level of 400°C. used for heat exchange for steam raising for electricity generation.

Gas Council research shows that pressure gasification processes can be operated at temperatures of the order of 800°C. so that by employing atomic fission as a source of heat the cost of gas production by such a process would be brought to a minimum level.

Radio Cobalt

In chemical reactions gaseous hydrocarbons, such as ethylene, are transformed by high temperature and pressure in the presence of a catalyst into a polymer, such as polythene. Experiments using a radio cobalt source at the Atomic Energy Research Establishment, Harwell, show that such reactions will occur in the presence of radiation without the high temperature—a major production economy. It is not fantastic to relate such a development to processes akin to our own activities.

I hope that the paper to be presented to this Association during the coming session by a member of the A.E.R.E. may give us a more comprehensive insight into the progress of nuclear energy applications which may be of advantage to our industry.

The Clean Air Act is now on the Statute Book and there is no doubt that it presents an admirable opportunity for the gas industry to secure additional markets for either its gaseous or solid smokeless fuels. That gas is the preferable fuel is a safe assumption but price will play an important part in securing any new business—for which there is very keen competition.

In the domestic field a vast number of appliances now burning smoke producing fuels could readily be supplied with one of the smokeless fuels, such as those now being produced at gasworks from non-caking coals, or changed for smokeless fuel appliances using gas coke. The smokeless fuels have caught the public imagination and peak sales have been reported. Their production, however, depends upon the availability of suitable coals for processing and these coals are still finding a ready domestic market.

Meanwhile the National Coal Board are proceeding with their own coal carbonisation schemes and it is apparent that the smokeless solid fuel market will not be an open field for the gas industry. We are, however, in a position to supply more gas and coke from existing plants and, if a firm trend in demand develops, the operation of our production processes can readily be adjusted to meet such a market requirement.

There is a great need for public education in the subject of clean air and it is to be hoped that local authorities will fulfil that duty by wise introduction of smokeless zones which will surely give rapid proof of their value to the economy and health of the nation.

The gas industry must take its own part in the campaign too, and make all efforts to set a good example by minimising the emission of smoke, grit or dust in the course of normal works' operations. The discharge of sulphurous gases to atmosphere is a feature of some of the new processes producing gas from oil feedstocks and it is necessary to build chimneys of approved minimum heights for such plants so as to achieve a satisfactory dispersal of the gases.

No matter by what process the future gaseous therm will be produced there has been a steady move by gas boards towards the integration of supplies throughout their respective areas and the elimination of production stations below optimum capacities or of obsolete pattern. This concentration of manufacture in fewer stations brings a marked increase in productivity and constitutes a method of increasing output without adding to the individual effort of the manpower involved.

In the Southern Board the 62 manufacturing stations which existed at vesting day have by now been reduced to 25 by integration within the regions of the area and even at these remaining works the costs of gas into holder vary through a range of proportion of 1:2½.

A so-called backbone main is now being laid between the northern and southern districts and this will link the principal production stations of the Board, eliminating those with the higher production costs. In consequence the number of stations will in time be reduced considerably further and so arranged geographically that the majority may be able to receive sea-borne supplies of coal or oil thus keeping prime costs of fuel at a minimum.

Sir Harold Smith recently forecast the possibility of a gas grid fed by works using numerous gasmaking processes, by coke ovens and oil refineries and with imported liquid methane. Area integration schemes are already approaching such standards and it would be a short stop to transform the whole into a national grid. A link for gas supplies between the Northern and Scottish Boards was completed this year and several similar links existed previously.

Target Attainable

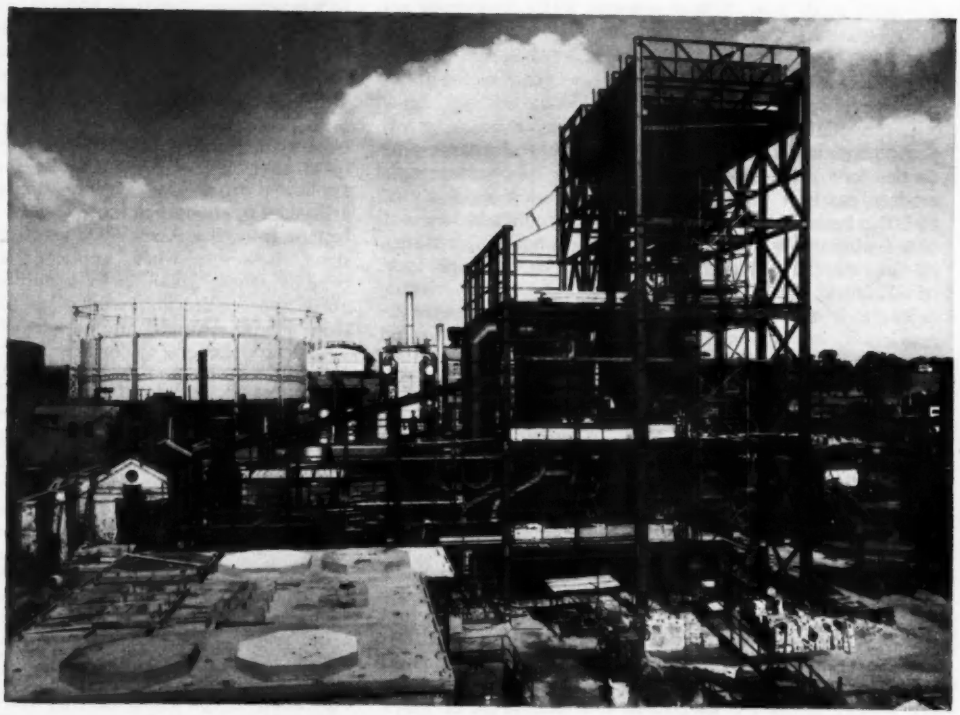
The location of the various types of gas-making plants nearest to the source of supply of their respective fuels would then be most easily accomplished and an opportunity would occur to develop large scale production units as advocated by Sir Henry Jones in his Presidential Address to the Institution of Gas Engineers. The national target of minimum production costs might then be attained.

It is a disquieting thought that although total sales of gas over the past ten years have shown an increasing trend, domestic sales have tended rather to decline while they still represent approximately 52% of the total sales. As the number of consumers has increased their consumption has reduced and this can be accounted for in some measure by the dispersal of a proportion of the consumers arising from re-housing, the improved efficiency of modern gas appliances and, to a lesser degree, the loss of domestic lighting.

Although electricity generally has the advantage of prior installation it is satisfying to know that over 85% of current new housing is also having gas installed. The average cost per unit for domestic electricity is probably 1¼d.-1½d. and, allowing 18 units electricity per therm of gas (i.e., gas appliance operating efficiency of 61%) the equivalent cost for gas would be 22½d.-27d. per therm. The current price of solid fuels is similarly so high that when allowing for the efficiency of their utilisation, gas proves to be truly competitive.

NOW UNDER CONSTRUCTION

The W-D/I.F.E. Complete Gasification Plant (G.I. System) at the Gloucester Works of the South Western Gas Board. This plant will have a gasmaking capacity of 2½ million cubic feet of 470 B.Th.U. gas per day.



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The commercial and industrial utilisation of gas has accounted for the industry's increased outputs. In the commercial field it is claimed that gas supplies over 90% of the catering establishments in Great Britain. Industrial gas has long claimed the advantages of efficiency of application, absence of storage requirements with supply on tap and complete combustion and, with the service now given in the field by the Boards' industrial gas engineers, there is every hope that the trend of increasing consumption will be maintained. In the forthcoming period of expanding production gas should secure a fair share of the projected fuel requirements of the manufacturing industries.

There is one feature of present town gas which must continue to have a bearing upon utilisation and that is its sulphur content. While manufacturing stations work rigidly to the Ministry of Power gas standards to produce gas free from H_2S the organic sulphur compounds may continue unrestricted. This sulphur cannot be removed from gas produced in conventional plants without substantially increasing the cost of gas, but a measure of reduction can be exercised.

The introduction of some of the alternative gas-making processes mentioned earlier, or the carbonisation of low sulphur coals, however, will open the way to supplying a gas with really low sulphur content. The availability of such supplies for water heating and flueless space heating could have far-reaching effects upon domestic gas sales.

Installation

Gas appliance manufacturers are constantly seeking improvements and the installation of their products must be carried out with maximum efficiency. As an example modern gas fires now have an overall bench efficiency of 65-70%, but this is easily reduced to a room efficiency of 50% by incorrect installation allowing excessive air changes in the room. This detracts heavily from the high level of efficiency of gas production.

There is no doubt that the additional hire-purchase restrictions imposed early in 1956 and the continuation of purchase tax on certain ranges of appliances have been an effective deterrent to increased sales. During the last financial year sales of cookers fell by 10%, gas fires by 17%, water heaters by 8% and refrigerators by nearly one-half. Cheaper appliances with reduced consumptions will ultimately bring increased sales—and to an industry which is far better equipped to meet peak demands than its principal competitor.

The wide field of development before us emphasises that the need for properly trained men in industry is greater than ever before. The pattern of integration and reorganisation within the area boards makes it clear that a much smaller proportion of those entering any department of the industry will be able to attain the highest positions. Our opportunities for advancement, however, are greater within the specialised technical fields in which we now operate than in the smaller organisations of pre-nationalisation days. Every entrant has these opportunities and the present schemes for education are unsurpassed.

A special sub-committee of the Institution of Gas Engineers has been appointed to consider revising the syllabuses of the examinations of that body so that candidates will complete a range of studies re-designed to fit the trends in the functional organisation of the industry.

Encouragement and assistance for technical studies to attain professional and academic qualifications are open to all and the introduction of sandwich courses at several of the principal technical colleges has provided a new impetus to gas engineering training. Such advantages are not limited to the early years of training as area boards have also arranged for selected personnel to attend management courses at Brooklands, Madingley, and Henley.

It is appropriate at this stage to mention the junior gas associations and one of the primary functions of this Association is to promote and extend the technical knowledge of its members.

We have a membership numbering approximately 450 and drawn from all fields of technical activities within the gas industry. The papers presented to the Association involve the writer in an immense amount of work and at the same time convey to the members a wealth of information on the selected subjects. The opportunity to receive and discuss such works is one to be valued by us all and I appeal for maximum attendances at future meetings. Similarly, our visits to works enable us to gain first hand knowledge of plant, processes and appliances and we are grateful to our various benefactors for the privilege of paying these visits.

Such activities of this Association help in no small way to equip its members with a wider experience than they would normally gain and to enable them the better to face and overcome the technical problems of the future.

In a recent issue of the technical press some criticism has been levelled at the standard of discussion occurring at technical meetings of various associations and which it is contended emanates from fear of rousing displeasure in our senior officers. My experience of the meetings of this Association makes it hard to accept such a charge as I believe our members have frequently been responsible for free speaking even in the presence of their most senior officers. I would say that all contributions to discussions at our meetings will be warmly received.

Qualified members of this Association are entitled to propose and second applications for new membership from interested personnel within the industry. Suitable applicants are welcomed to membership and our members are asked to encourage those to join whom they feel would benefit from the Association's activities. There are occasions, however, when applications are received from persons whose qualifications and appointments are not quite appropriate and who might derive greater benefit from membership of another association. I request all members, therefore, to consider and advise applicants carefully in relation to our rules and thereby to assist the Council in the wise selection of new entrants.

Labels for Gassing Casualties

A SECOND edition of *Gassing Casualties*, a system of labels to accompany gassing casualties sent to hospital, has been published by the Association of British Chemical Manufacturers. The first edition of this booklet, drawn up by a medical panel of the Association of British Chemical Manufacturers, issued in 1952, was designed to contribute to industrial safety by providing casualty officers at hospitals with a correct history and diagnosis of cases of gassing from the commoner gases and vapours. The object was to enable the appropriate treatment to be instituted without delay. The booklet and labels, supplied separately in pads of 12 ready for use, created interest at home and abroad. It was welcomed by the hospitals and medical organisations and has been adopted by the Admiralty. Many chemical firms sent copies to their customers and to their local hospital.

The labels have now been reviewed and brought up to date in the light of the various comments received, and of developments in manufacture and medical treatment since 1952. A label has been added for cases of gassing by an unidentified gas, and the booklet has been bound in a cover which is readily identifiable on a shelf. The booklet is obtainable from the Association at Cecil Chambers, 86, Strand, London, W.C.2 (price 5s. to non-members, 3s. to members, post free, cash with order). The pads of labels for the various gases cost 2s. 6d. each.

Presidential Address to the East of Scotland Junior Gas Association, October 8, 1957

Development and Its Effect on Staff

By JOHN M. BROWN, A.M.Inst.Gas E.,
EDINBURGH DIVISION, SCOTTISH GAS BOARD.

OF all the changes which have occurred during the life of our industry the most momentous was that of May 1, 1949, when it came under public ownership for the first time. At vesting date the industry was composed of 1,050 undertakings many of which were short of production plant, with existing plant often in poor condition and in many cases being run on an uneconomic basis. The dominating factor in all fuel industries during this period was that of recurring crises due to the demand for services far exceeding the available supply. The policy which had to be pursued by the industry in a number of areas was not to attempt to take on demands which could not be adequately met but to make every effort to ensure that available plant was brought into maximum use to ensure that existing commitments were honoured. At the same time future development was programmed so that a steady increase in the rate of demand could be handled.

During the past eight years work has continued on the installation of new production plant, sustained efforts have been made to improve the efficiency of existing production plant and production at many small and uneconomic works has been discontinued after grid mains have been laid, linking them to large and more efficient works.

Stations Closed

As a result of these efforts over 400 production stations have been closed down and the maximum daily capacity of plant installed rose from 2,060 mill. cu.ft. of gas per day at May 1, 1949, to 2,497.1 mill. cu.ft. of gas per day at March 31, 1956, an increase of 21.2%. The efficiency of production has risen, the productivity of the men employed in the industry has increased, and the service to many thousands of consumers has improved beyond recognition. The tremendous change in the framework of the industry has of course entailed the expenditure of considerable amounts of capital and in the seven years to March 31, 1956, £318,809,629 was spent on the provision of plant, machinery and mains.

How have the great changes in the structure of our industry affected personnel and in particular those who are members of the Junior Gas Associations? Have these changes been good both for the industry and for the people involved? What is the future of the industry and how will we on the technical side of the industry fit into that future?

In most cases the changes which have occurred have affected the people from the small to medium sized undertakings to a far greater extent than their colleagues from the larger undertakings. Previously in the smaller undertakings the engineer and manager and his assistant were concerned with all the various aspects of running the business and generally had to know a little about everything, with perhaps a greater degree of specialised knowledge in one particular field. Most area boards have now dispensed either completely or in part with this system and have introduced functional organisation in which each officer specialises in this own particular field. This has been the major change and must inevitably lead to better performance of the work to be carried out, especially when it is realised that the efficiency of the industry as a whole will rise only to the degree that each component member of the organisation contributes the maximum effort in his own particular field to building up the aims of the industry.

One problem which does present itself in the functional organisation is that of the choice of future top management personnel, and here we on the technical side of the industry must face up to the fact that the future higher executives will no longer necessarily be drawn from our ranks. This does not mean, however, that there should be any despondency but rather that the technician must show clearly that he is as capable of the foresight and comprehensive vision required for general management as are members from other sections of the industry. To-day, the function of management is not something which can just be tacked on as an appendage to previously acquired technical knowledge and expanded as times goes by, but must be obtained by observation and study. In the years before the industry was nationalised the potential manager could, by the choice of his movements, go from the general managership of a comparatively small undertaking by progressive steps to the management of a large undertaking, and by a gradual expansion of his capabilities be fully equipped for the work eventually required of him. In a functional organisation it is very easy, unless guarded against, for the specialist to lose sight of everything apart from his own particular speciality, and I consider that in addition to being bad preparation for an eventual transfer to general management it may also be bad for the individual.

Technical Knowledge Needed

The integration and closure of small works, the expansion of the larger works, together with the introduction of new types of plant, and the development of integrated grid mains systems have all led to an increase in the demand for specialised technical knowledge. This in turn has increased the need for properly qualified technical staff throughout the industry and has meant also that many of the existing technical staff have had to develop to a high degree one particular aspect of their previously generalised technical ability. At present there is still a shortage of technically qualified men coming forward and it is essential that this shortage should be remedied.

I feel that the changes which have taken place in the industry up to the present have in general benefited members on the engineering and technical side of the industry. In many cases there has been a diminution in general management responsibility, but this has been compensated for by increased demands on the technical knowledge of the personnel concerned.

With respect to the industry itself, however, the position is not quite so satisfactory as we could hope for. Despite the large amount of capital expended and the large increase in manufacturing plant capacity, sales have not risen appreciably. In 1950-1951 sales by all areas boards amounted to 2,402.3 mill. therms and in 1955-1956 had increased to 2,584.8 mill. therms, an increase of 7.6%, or an average of just over 1.5% per annum.

The main reason for this disappointing performance has been our lack of success in the domestic field where sales

have generally remained at what might be called 'the cooker and wash-boiler only' stage. Many reasons can be put forward to explain away this slow degree of expansion. Increases in the price of gas caused by increased raw materials and labour charges; the effect of the credit squeeze on hire purchase and the present iniquitous level of purchase tax on space heating and water heating equipment; fierce and often unfair competition from the electricity authorities who are attempting to improve their position in the domestic market and are minimising the effect of price increases to the domestic consumer by disproportionate increases to the industrial consumer who is entirely dependent on them.

One of our major difficulties in the past has been that we have not been able to compete with the use of solid fuel for space heating and water heating because of our pricing system, but the introduction of a two-part tariff such as that introduced by the Scottish Gas Board this year has immeasurably strengthened our hand and should help us to obtain our additional load. The standard of living in this country is rising and as it does so, domestic consumers of fuel will tend to demand more and more that their fuel will be presented to them in a refined and convenient form. For the small consumer this inevitably means a choice between gas or electricity, and with the proper tariffs and a sustained sales effort the gas industry will obtain its share of the increased demand.

Assuming, as we must, that our concentrated sales efforts will meet with success, the industry is also faced with the problem of deciding upon the future pattern of development on gas production.

Less Coal

Despite the large amount of capital being expended by the National Coal Board on the development of new pits, the quantity of coal being mined which is most suitable for carbonisation is declining. Coals which are readily available to the gas industry are in 800 and 900 rank classifications, and even here it appears that the supply of the better types of this coal is becoming less. It is unlikely, therefore, that any more large installations of the conventional type of carbonising plant will be erected because of the diminishing quantities of carbonising coal available and also because of the high capital cost of this plant.

The processing of coal through complete gasification processes does not necessitate the use of coal with good coking properties and low ash content, and it is therefore likely that any new plant erected in the future for the production of gas from coal will be of this type. Production of gas at very high pressures in this type of plant will permit the transmission of gas for greater distances than is the case at the present time, and would allow the plants to be erected close to the source of the coal supply.

There is also the likelihood of a considerable increase in the production of gas from oil and also, if the price is right, the importation of liquefied gases from the oil producing areas of the world.

Immense though these future developments may be they do not necessarily mean that the day of the conventional type of carbonising plant will be over for many years to come. Run as base load plant, the cost of gas production in this type of plant at large works at 8d. to 9d. per therm is low enough to justify their continued existence.

The new types of gas-making plant which will be coming in the future will necessitate the employment of staff with well developed technical ability, and again it will be necessary for many of us to adapt ourselves to the new techniques which will be required. The accent will be more on men with a chemical engineering background, and it may be necessary for the educational requirements for membership of the Institution of Gas Engineers to be adjusted accordingly.

When trying to see what the effect of the future will be on the staff of the industry, consideration must be given to the possibility of the introduction of automation techniques. Basically, automation is a system in which processes are carried out by mechanical means, controlled automatically by electronic computor units, and the control of the process is *independent of human interference*. If this definition is acceptable, then, although great progress has been made in the gas industry in reducing manual effort by the introduction of improved mechanical handling plant and a finer degree of control over process work has been made possible by improvements in instrumentation, these can only be considered to be the first steps towards the introduction of automation.

The first and most obvious application to the gas industry is on the accounting branch of the industry and the use of computers for billing, costing, statistical research and other purposes has now been generally recognised by large commercial organisations and, in fact, several area boards are now going ahead with the introduction of computers for this purpose. We in the technical staff of the industry would greatly benefit by the introduction of this equipment and would be able to obtain the cost and statistical information so essential for economic and efficient control of our processes much more quickly. To have effective control of any operation involving the use of labour and the processing of materials, we must have modern methods of assembling information quickly and accurately, and this can be accomplished with the aid of the computer.

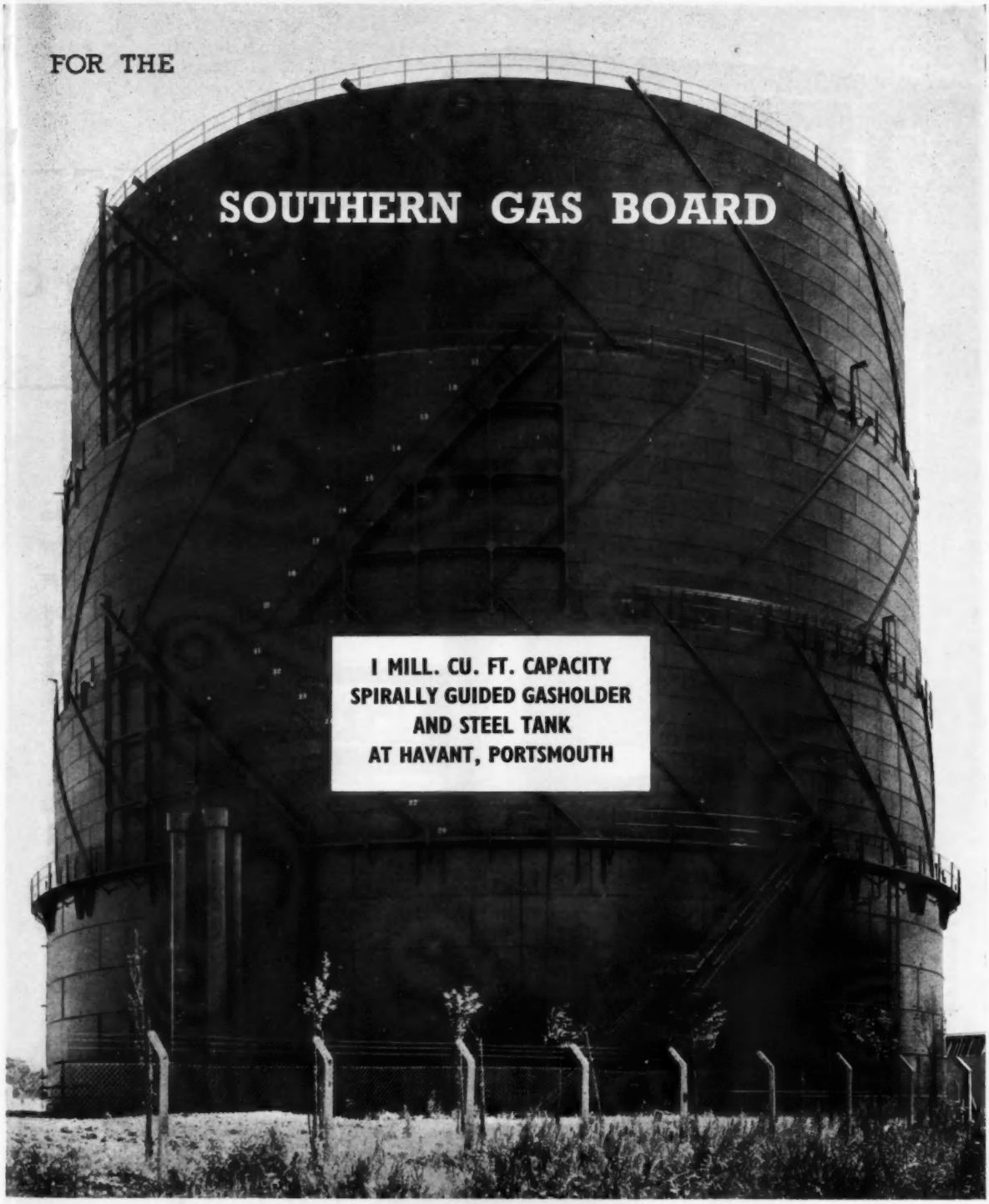
The distribution engineer can also adopt the computer for his own purposes, and a digital computer arrangement is available for use in the calculation of pipe sizes, pressure drops and pumping pressures, for complex mains networks, and again the emphasis is on speed and accuracy.

Remote Control

On integrated distribution systems the use of distant indicating and remote control equipment has reduced the manpower required for efficient operation of a grid, and it might be considered to be logical to proceed one step further and to introduce a computer to control the movement of the gas flow throughout the grid. It would be possible to devise a unit for this purpose, but on purely economic grounds it would be difficult to justify such an installation as the number of personnel normally required for a grid control is small.

The use of automation for control of gas production plant will of necessity be a function of the type of plant. In the case of large complete gasification units, carburetted water gas plants and oil gas plants, the labour employed is generally of a supervisory nature, the manual effort being reduced to a minimum, and it would appear that the introduction of automation would be relatively easy. The decision of whether or not computer control is introduced must depend, at present, upon the cost of the installation of the control equipment compared to the financial saving obtained by the elimination of the operatives, and I am doubtful if it would be financially attractive on the plants which have been referred to. If, however, developments in the electronics industry reduce the cost of computer installations the position would be altered.

Even in the conventional carbonising plants the labour cost is far outweighed by the materials cost, but it is still considerable. In many ways it is hard to get the right type of operative for shift work and in some cases it is very difficult to obtain labour for shift work at all. It would therefore be of considerable benefit to be able to eliminate completely the necessity for shift operatives



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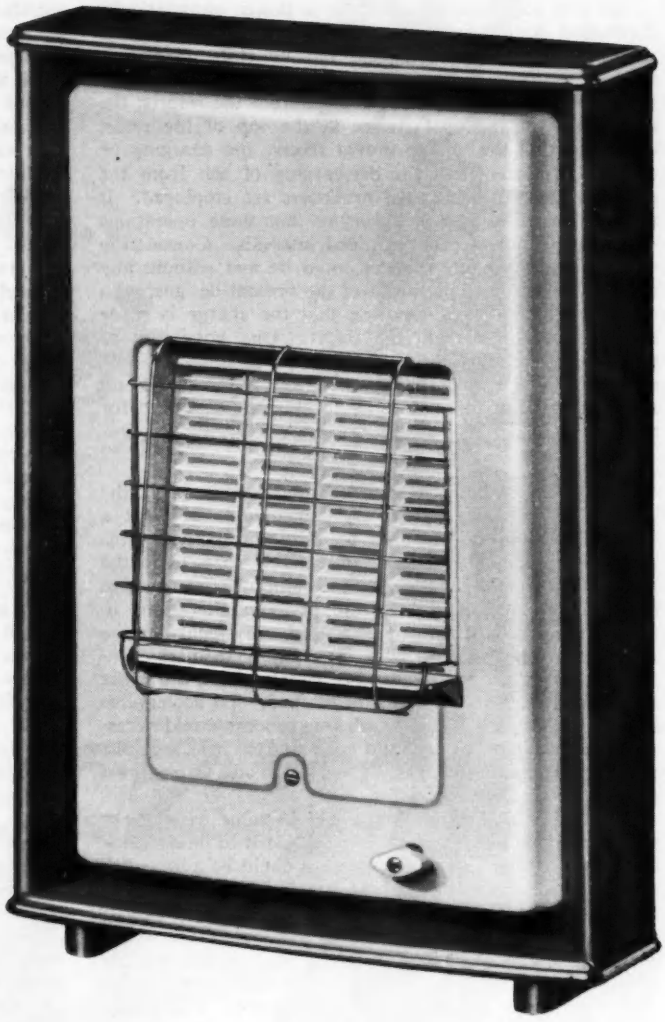

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and it would be interesting to consider what would be required for this purpose.

The first requirement would be to design automatically controlled equipment which would obviate the manual work at present being carried out by shift operatives. Operations in this category are the charging of retorts with coal; the discharge of the coke from the retorts; the disturbance of the coal charge at the top of the retort to ensure that the charge moves freely; the charging of coke to producers and the discharging of ash from the producers where mechanical producers are employed. It would also be necessary to ensure that these operations were carried out at predetermined intervals. Considering these provisions I feel that all could be met without any necessity for radical alteration of the present designs, with one exception, that of ensuring that the charge is made to move evenly through the retort. One possibility of ensuring this would be the introduction of some form of mechanically operated stirrer at the top of the retort and a development of this nature could eliminate the need for rodding.

Many Variables

It is when we come to the second requirement, the control of the process, that the implications of what a computer would be required to do impress themselves upon the mind. The number of variables present in the gas-making process is great, and the computer must receive information continuously on the periodic alterations in these variables, assess them and send out signals to the various controls so that they will adjust themselves in accordance with a pre-arranged programme to ensure that all the pre-set conditions are maintained. To accomplish the efficient control of the gas making process would necessitate the provision of coal and coke analysis; gas analysis; pressures; temperatures; gas, liquor, steam and water flows, weights of coal and coke, etc.

To obtain this information would in some cases mean that entirely new test apparatus would need to be designed since although present day equipment could be adopted to give continuous analysis of gaseous and liquid elements, there is no such apparatus which would give, automatically, analyses of coal and coke. The second major task would be the provision of memory tapes in the computer against which the information fed into it would be evaluated prior to the necessary action being decided upon. The multiplicity of variables which affect the efficient performance of carbonising plant would require to be set out in tape form, the effect of alteration on one or the other would have to be assessed for each case and the order and magnitude of changes required to compensate for particular variations would have to be decided upon. To make up the programme would entail an intensive investigation into all aspects of the carbonisation process, but once carried out it would only require to be modified as and when conditions arose which had not been foreseen when the original programme was evolved.

From this very brief assessment of the requirements for the introduction of complete automation to the carbonising process it would appear that under present conditions we have not progressed sufficiently for this to be brought about. Nevertheless, I feel that if one considers only the first stage, that of the complete elimination of the manual worker on shift, there is the possibility of justifying the installation of that section of the equipment. Considering the hypothetical case of a works producing 30 mill. cu.ft. of gas per day from continuous vertical retorts, the amount paid out annually for shift labour might be approximately £70,000. The capital outlay corresponding to this annual payment would be approximately £750,000 assuming a depreciation period of 15 years and allowing for repayment at an average rate of interest. If the labour position deteriorates further then we may find that in the future we must adapt our plant to eliminate labour even if it is not economical financially.

Worth Investigating

To come back to the financial justification, however, 30 mill. cu.ft. of gas per day can be made in an installation of 300, 50-in. major axis retorts which would allow an expenditure of £1,500 per retort and £200,000 elsewhere (that is assuming an expenditure of £10,000 per annum would still be necessary for shift technical supervision). The figures quoted are only general, but I submit they do indicate that the possibility of the introduction of automation to the carbonising process might be worth further detailed investigation.

One point, however, does emerge and that is the continued need for the technician. The ultimate automated plant is one in which the electronic control unit diagnoses its own faults and then proceeds to take the necessary action to remedy them. In the cases considered, this possibility is very, very far away, and it will therefore be necessary to have staff available to provide information to the computer and to check on its performance. In fact, if anything there would probably be a need for an increased number of technical staff, although again their duties might be radically altered.

WILL BE WELCOMED BY INDUSTRY

New British Standard for Belt Conveyors

PUBLICATION of the new British Standard for troughed belt conveyors (B.S. 2890) is likely to be welcomed by industry for a variety of reasons. Far more than in previous conveyor standards B.S. 2890 provides for the comprehensive standardisation of all major components thus making for easier interchangeability and replacement of parts.

The main sections of this 40-page standard specify important dimensions, and recommended limiting dimensions for the principal mechanical parts, e.g., idler sets, pulleys and shafts. There is also much information on general mechanical requirements. Certain conditions are specified with regard to the provision of take-up devices, skirt plates, trippers (where applicable) and safety devices.

Specifically, the standard applies to ' . . . troughed belt conveyors incorporating rubber and cotton fabric belting manufactured to B.S. 490 for handling materials in bulk, within the range of belt widths from 14 to 60 in.'

Inevitably, the installation in a factory of such a conveyor could present many pitfalls not least because of the many safety precautions which a conveyor must incorporate. Here, two of the standard's appendices will prove of assistance. One lists 28 items of information which the purchaser should supply to the manufacturer; the other lists 18 items of information which the manufacturer should supply to the purchaser. Another appendix lists the titles of eight statutory provisions affecting conveyors. Yet another provides a 'quick reference' list of British Standards with which a conveyor should comply —the information being tabulated under 'Materials,' Mechanical details' and 'Electrical details.'

Note.—The standard does not apply to feeder belts and underground mining conveyors; nor does it apply to the handling of materials of which the liquid content is such that the material does not behave as a solid.

Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London. W.1. Price 8s. 6d.

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When is an Employee Acting in the Course of his Employment?

T. J. SOPHIAN EXPLAINS THE LEGAL ASPECTS OF THIS QUESTION

WHEN is an employee acting in the course of his employment? When does he cease so to act? These are questions of considerable importance since they affect the question of the liability of employers for the negligence of their servants.

If a person causes damage to another through some wrongful act, such as trespass or negligence, his employer cannot be held responsible unless the culprit was acting in the course of his employment.

If the wrongful act was authorised by the employer, then clearly the employer would be just as liable as his servant. But the act although authorised by the master, may be done in an unauthorised manner which is wrongful. In such a case the employer could not escape liability, even though he may have expressly prohibited the employee from conducting the particular operation in the wrongful manner in question. Thus for instance van drivers may be expressly instructed to observe speed limits and other requirements of the Road Traffic Acts. If, notwithstanding such warnings, a driver raced other vehicles and drove dangerously, and caused an accident, his employer would be liable.

'A Frolic of his Own'

On the other hand it is not enough that the negligence or wrongful act is committed at a time when the servant is engaged on the master's business. It must be committed in the course of that business. Thus a van driver who is delivering goods of his employer, may make a temporary deviation to give a friend a lift to a station or a hospital. During such time as he is giving the lift, he cannot be regarded as acting in the course of his employment; he is engaged in fact 'on a frolic of his own' and on something solely for his interest. The employer therefore could not be held responsible for an accident which might occur during this period, through the driver's negligence.

A useful, but by no means the only, test, which is often adopted is whether the business in which the employee was acting at the time equally concerned him and his employer. If so, then the employee must be regarded as acting in the course of his employment.

Collection of Wages

Recent cases have raised the question whether a person can be regarded as still acting in the course of his employment, where after working hours, he goes to collect his wages. In Lowry v. Sheffield, etc., Co., Ltd., which was decided in 1907, the employee had finished his work on Saturday morning, and was not due to resume work till the following Sunday night. After a substantial interval of time, he went back on the same Saturday to the pay office to collect his wages, as he was required to do if he wanted payment. While he was on the way he sustained an accident on his employer's premises. The Court held that the employee was still acting in the course of his employment for the purpose of claiming workmen's compensation under the then Workmen's Compensation Act.

The basis of this decision appears to have been that it was part of the contract of employment, that the Company should pay him his wages at the pay office and that he should go there to collect them. In the view of the Court it was just as much part of his employment to go to the pay office on that day and at that hour, as it was for him to resume his work on the following Sunday night.

The principle of this case was further extended in 1911 by the case of Riley v. Wm. Holland & Sons Ltd. Whereas in the former case the employee's employment was still continuing, in the latter, the employment had terminated. The employment ceased on a Wednesday, and the employee went back to collect her wages on the following Friday, in accordance with the practice at the place of work. It was held that she was still in the course of her employment (although it had been terminated), while she was on her employer's premises, for the purpose of collecting her wages.

What is to be said, however, of the case, where the employee is not on the employer's premises, though he is on his way to collect his wages at the appointed place and time? He might be for instance, on his own premises or on the premises of some other person, or on the highway.

Although this point does not appear to have been decided as yet, the general view appears to be that the employee is not to be regarded as being in the course of his employment in such circumstances, and that he does not begin to be in the course of his employment until he reaches his employer's premises.

The points raised by the two cases mentioned above arose again for consideration in the recent case of Staton v. National Coal Board 1957, 1. W.L.R. 893. In this case an employee received fatal injuries as the result of the alleged negligence of a fellow employee, these acts being committed, it should be noted, on the premises of the employer. The question arose whether the fellow employee was at the time of the accident acting in the course of his employment, so as to render his employers liable for the accident.

Returned to Place of Work

The circumstances were these. The fellow employee had completed his actual work in the morning and had gone home. In the afternoon, he returned to his employers' premises, and at the time of the accident he was proceeding from the time office, where he had obtained his time sheets, to the general office, to draw his wages. The employers required their employees to call at the general office at particular times of the week, of which this was one, to draw their wages.

The Court held that the fellow employee was engaged at the time on business which equally concerned him as well as his employers. For it was in the interest of both that the servant should draw his wages and that the employer should pay them, since, otherwise, no work would be done. It was partly the duty of the employee to go to the pay office to draw his money, and it was partly the business of the master who had to pay the wages and who found it convenient to pay them at those times and at that place.

Crossing the Street

Accordingly the fellow employee was acting in the course of his employment, so as to render his employers liable for his negligence, if such negligence was established.

In contrast to these cases, one may cite the case of Crook v. Derbyshire Stone Ltd. 1956. 1 W.L.R. 432. Here a lorry driver had parked his lorry, and was crossing the street to get refreshment at a café when he was involved in an accident with a motor cyclist. It was held that though the employers were aware of this practice, and although it was a perfectly proper one, yet, as soon as the driver had parked his lorry to cross the road to get to the café, he temporarily ceased to be acting in the course of his employment and was acting for his own purposes. Accordingly his employers could not be held responsible to the motor cyclist for the consequence of his alleged negligence.

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Subscription Rates: Home 65/–; Overseas (from Sept 1, 1957) 72/6 per annum; (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/–. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10 in. deep × 7 in. wide; block screen 120.

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EDUCATIONAL

WOODALL-DUCKHAM EDUCATIONAL AWARDS

APPLICATIONS are invited before November 30, 1957, for two awards to be made by The Institution of Gas Engineers from the Woodall-Duckham Educational Fund. Each award will enable the holder to attend two of the Summer School Courses at the Institute of Gas Technology, Chicago, in the Summer of 1958. One award is for the courses on Natural Gas Production and Processing and on Natural Gas Fuel Utilization and the other for those on Natural Gas Transmission and Natural Gas Distribution. Applicants should preferably be between 25 and 32 years of age and should either hold a University degree in engineering or science or be a Corporate Member of The Institution of Gas Engineers, or of some other appropriate professional institution. The value of each award (including subsistence and travelling expenses) will be £500.

Conditions from the Secretary, The Institution of Gas Engineers, 17, Grosvenor Crescent, London, S.W.1.

APPOINTMENTS VACANT

NORTH WESTERN GAS BOARD

WIRRAL GROUP
TECHNICAL ASSISTANTS (PRODUCTION)

APPLICATIONS are invited from suitably qualified persons for the above pensionable appointments at salaries within Grades A.P.T. 6/7 (£640/£785 p.a.).

Applications, on the official form which can be obtained on request, should be returned not later than Saturday, November 9, 1957, to the General Manager, North Western Gas Board, Wirral Group, Hind Street, Birkenhead.

(*Classified advertisements continued on page* 208)

APPOINTMENTS VACANT (ctd.)

COKE OVEN MANAGER: South Durham Steel & Iron Co., Ltd., invite applications for this post at the Coke Oven, Bye-Product and Benzole Refining Plant at the Middlesbrough Works. Superannuation and house provided with a salary commensurate with experience. Applications marked 'Private and Confidential' to General Works Manager, Cargo Fleet Iron Works, Middlesbrough.

WALES GAS BOARD

ASSISTANT ENGINEER AND MANAGER, ABERYSTWYTH UNDERTAKING

APPLICATIONS are invited for the position of ASSISTANT ENGINEER and Manager to the Aberystwyth Undertaking.

Applicants should be experienced in the control and operation of W.D. Vertical Retorts, ancillary works plant and control of labour.

Experience in distribution, including Main and Service work; planning and sales promotion would be desirable.

The successful candidate will be required to give technical assistance to Undertakings in the Cardigan Bay Group.

The salary will be within APT 8 A (£745/£825) per annum of the National Salary Scale for Gas Staffs. The post is pensionable. A modern house is available at a reasonable rental.

The successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with details of present and previous appointments and the names of two referees, should be received by the undersigned within fourteen days of the appearance of this advertisement.

I. W. THOMAS,
Engineer and Manager.

Wales Gas Board,
Park Avenue,
Aberystwyth.

SCOTTISH GAS BOARD

GLASGOW AND WESTERN DIVISION
TECHNICAL ASSISTANTS (ENGINEERING)

APPLICATIONS are invited for posts as TECH- NICAL ASSISTANTS (ENGINEERING) in the Gas Works at Glasgow, Greenock, Kilmarnock and Dumbarton.

Candidates should have a sound knowledge of principles and practice of the efficient operation of Boilers, Engines and other Steam Plant. Some knowledge of Belt and Bucket Conveyors and other Bulk Mechanical Plant is desirable.

Candidates should possess or be completing their studies for the Higher National Certificate in Mechanical Engineering or its equivalent.

The appointment will be within the Scale (Provincial A) Grade A.P.T. 6/7 (£640-£785 per annum), with placing therein according to qualifications and experience.

The posts are pensionable and the successful applicants will be required to pass a medical examination.

Applications marked 'TA/E,' stating age and giving particulars of education, training, experience and qualifications, should be addressed to the Personnel Officer, 9, George Square, Glasgow, C.2, within 14 days of the publication of this notice.

SCOTTISH GAS BOARD

GLASGOW AND WESTERN DIVISION
TECHNICAL ASSISTANTS

APPLICATIONS are invited for a number of posts as TECHNICAL ASSISTANTS in the Gas Works at Glasgow, Paisley, Greenock, Kilmarnock, Coatbridge and Motherwell.

These Works form part of the Glasgow and West of Scotland Grid, and the successful applicants will be given every opportunity to further their knowledge and experience.

Applicants should possess, by examination, a recognised qualification in Engineering, Chemistry or Fuel Technology and should have completed their National Service.

Candidates should have practical experience in the operation and control of modern Gas Works plant with special reference to Continuous Vertical Retorts and Carburetted Water Gas Plant.

The appointments will be within the Scale (Provincial A) Grade A.P.T. 6/7 (£640-£785 per annum) with placing therein according to qualifications and experience.

The posts are pensionable and the successful applicants will be required to pass a medical examination.

Applications, marked 'T.A.' stating age and giving particulars of education, training, experience and qualifications, should be addressed to the Personnel Officer, 9, George Square, Glasgow, C.2, within 14 days of the publication of this notice.

SCOTTISH GAS BOARD

GLASGOW AND WESTERN DIVISION
PRODUCTION AND TECHNICAL SERVICES
SENIOR TECHNICAL ASSISTANT
DIVISIONAL HEADQUARTERS STAFF

APPLICATIONS are invited for the post of SENIOR TECHNICAL ASSISTANT on the Staff of the Divisional Production Engineer, at Head Office, Glasgow and Western Division.

Candidates should possess a Higher National Certificate in Mechanical or Gas Engineering, Fuel Technology or Chemistry and be a Corporate Member of an appropriate Professional Institution.

The appointment will be within the Scale (Provincial A) Grade A.P.T. 9/10 (£795-£960 per annum) with placing therein according to qualifications and experience.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications marked 'STA/PE,', stating age and giving particulars of education, training, experience and qualifications, should be addressed to the Personnel Officer, 9, George Square, Glasgow, C.2, within 14 days of the publication of this notice.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
TECHNICAL ASSISTANT (PRODUCTION)
BOSTON GROUP

APPLICATIONS are invited from suitably qualified persons for the position of GROUP TECHNICAL ASSISTANT (PRODUCTION) at Boston at a commencing salary within Grade A.P.T. 6/7 (£640/£785 p.a.) according to age, qualifications and experience.

Applicants should preferably be in possession of the Institution of Gas Engineers' Higher Grade Certificate in Gas Manufacture or equivalent qualifications and they should have had experience of modern vertical retort installations.

The post is superannuable and the successful applicant will be required to pass a medical examination. He will also be required to join the Board's Staff Pension Scheme.

Applications giving details of education, training and experience together with the names and addresses of two referees should be addressed to reach the undersigned not later than November 2, 1957.

BERNARD CLARKE,
Divisional General Manager.

Belle Vue House,
Carline Road,
Lincoln.

NATIONAL COAL BOARD

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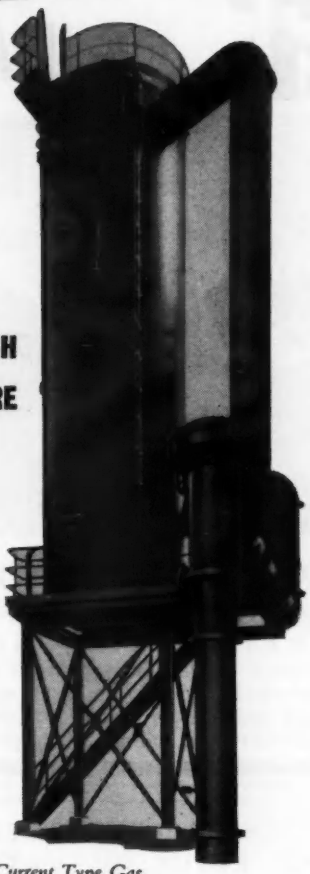

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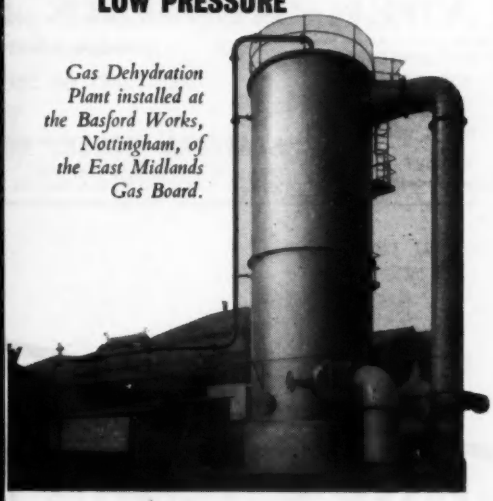

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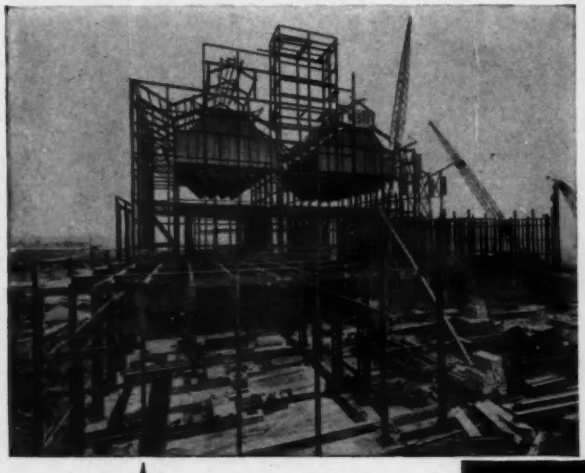

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